Manual

SimpleDemo

Product name	Version	
SimpleDemo	1.2	
Last Change	Author	Document revision
27.09.22	Jürgen Gries	6

Contents

1 General

scemtec Transponder Technology GmbH (STT-ID) reserves the right to make changes or to discontinue its products or services at any time without notice.

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STT-ID assumes no liability and is not responsible for infringement of patents and/or any other intellectual or industrial property rights of third parties, which may result from assistance provided by STT-ID.

All other products mentioned in this document might be brands or brand names of the different suppliers.

1.1 RFID Systems

As this technology is based on radio frequency, one must exercise the following operational and mounting instructions to achieve best performance:

- Metal affects radio signals. Normally the antenna has to be as far away as possible from any metal object and it's damping influence on the magnetic field. Only this leads to the best distribution of the magnetic field in the reading range. Very important as well is not to have "short circuits", in the vicinity of the antenna, damping the magnetic field. A "short circuit" is any metal near the antenna, building a "metallic ring", so that currents introduced by the RF-field can flow, absorbing the energy needed for the tag to operate.
- Care must be taken to reduce or eliminate unwanted signals (so called interference or noise) from external sources. The reading range may be reduced by following noise sources:
  - portable two way radio
  - cellular phones
  - switching power supplies
  - computer monitors
  - frequency converters (e.g. motor control systems)
- The read range is depending upon
  - performance of the Reader
  - size of the antenna
  - size of the tag (the bigger the better)
  - orientation of the tag antenna plane to the Reader antenna plane
  - quality of the tag
  - matching of Reader antenna size and tag (-antenna) size
  - environmental, electrical noise
  - If influence of metal can not be fully avoided a tuning of the antenna is required and will improve reading range

2 Safety Informations

As with all electronic systems, the system described hereafter may not be used for any applications critical for maintaining safety. This means, the products may not used in life support applications or any other life critical applications that could involve potential risk of death, personal injury or severe property or environmental damage.

The user/operator is solely responsible for any damages resulting from an improper or unintended utilization of the system.

3 System Description

The sttID-SimpleDemo is designed to be an application for using the basic functionalities of a RFID device built by scemtec Transponder GmbH.

Main features are:

- scan (once or continuous) for RFID tags and display information like:
  - tag type, unique identifier, values of the tag memory and the antenna which scanned the tag
- write values into the tag memory
- set the antenna power
- activate/deactivate antennas
- export displayed information to *.csv files

4 Installation

SimpleDemo is available for installation in two different flavours:

- as ZIP-file “SimpleDemo v1.x.xxxx.zip” containing just the SimpleDemo.exe file
- as Windows installation package “Setup sttID Simple Demo v1.x.xxx.exe”

Depending on what kind of installation file you have, please continue with reading either chapter 4.1 or 4.2.

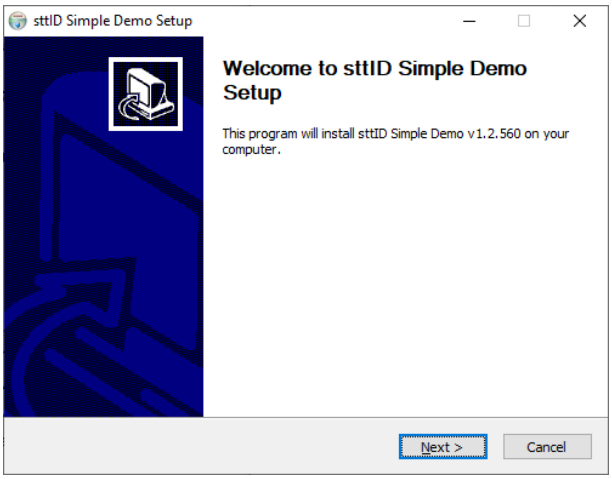
4.1 Installing from ZIP file

Installation is quick and easy:

- Just extract the SimpleDemo.exe file from the ZIP file to a location on your PC you prefer e.g. right onto the desktop.

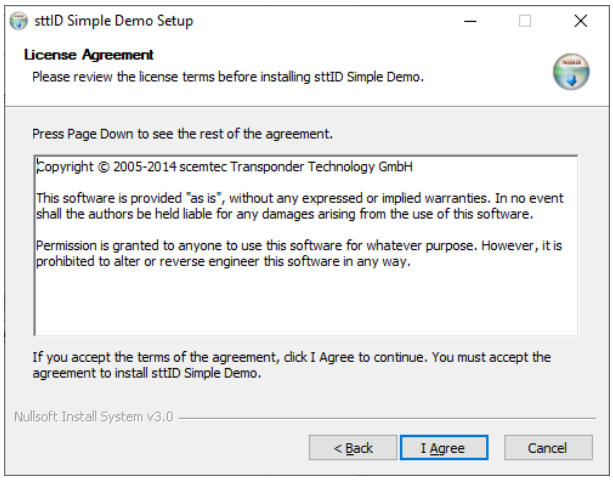
4.2 Installing the “Setup sttID Simple Demo v1.x.xxx.exe”

- Run the “Setup sttID Simple Demo v1.x.xxx.exe”.
- If the UAC (User Account Control) dialog is displayed, accept installing the software by clicking on „Yes“
- Confirm the „Welcome to sttID Simple Demo Setup“ dialog window by pressing the „Next“ button



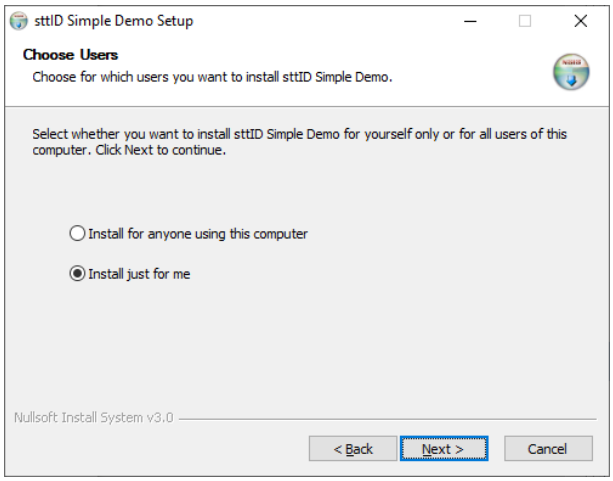
Picture 1: Installation - Welcome dialog

- Confirm the license agreement next by clicking on „I Agree“



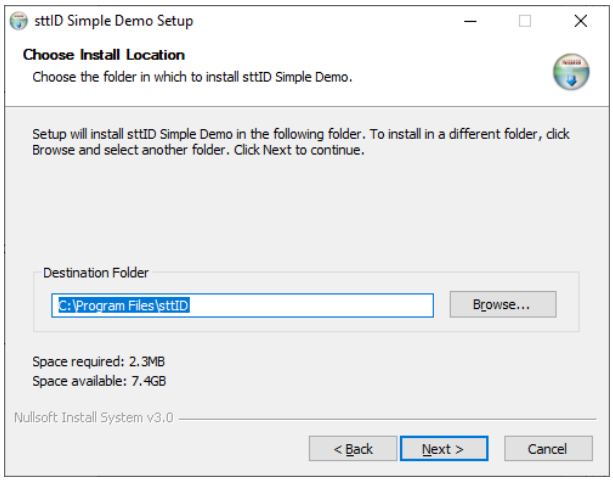
Picture 2: Installation - License agreement

- Choose whether to install the application for all users or just for your user on the PC and continue with clicking „Next“.



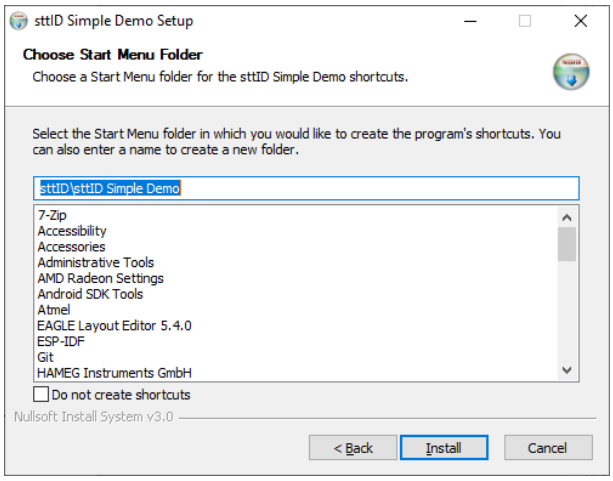
Picture 3: Installation – Choose users

- Select a destination folder and continue with clicking the „Next“ button.



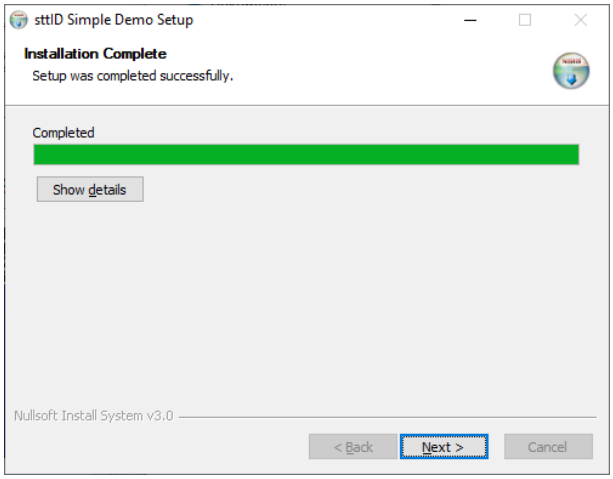
Picture 4: Installation - Destination folder

- Select a start menu folder and press „Install“ button afterwards.



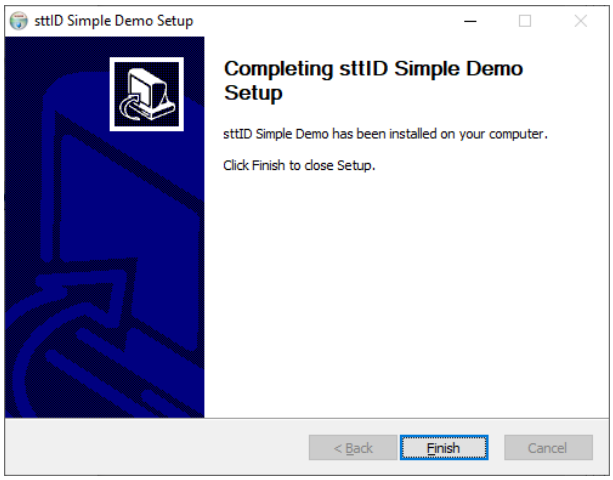
Picture 5: Installation - Start menu folder

- When copying files is complete, continue with clicking the „Next“ button.



Picture 6: Installation – Progress dialog

- Confirm the final dialog window by clicking „Finish“ and you are done.



Picture 7: Installation - Complete dialog

5 Start

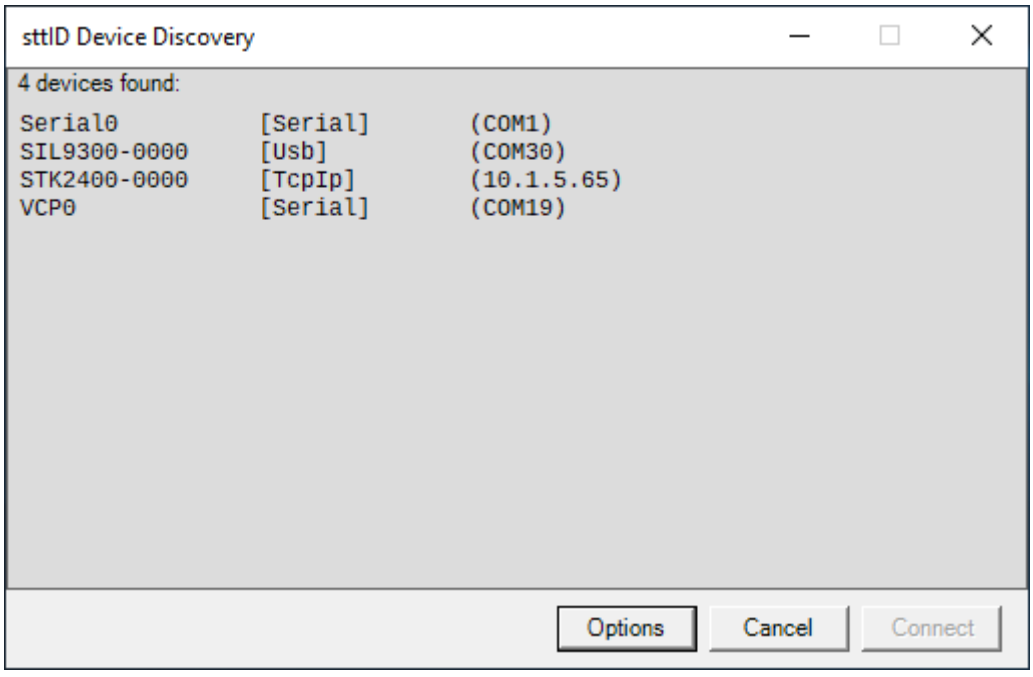
First of all you need to connect your scemtec RFID device to your PC. This may be performed by one of the below options:

- Plug the device to a free USB port at your PC
- Plug the device to the PC's RS232 port
- Connect the device with a network your PC is linked to

Check the interfaces provided by your particular scemtec RFID device and those available at your PC and choose an appropriate option. (*Note: Not all scemtec RFID devices may provide all kind of interfaces*).

Next start the application by clicking on the installed SimleDemo.exe (or SimpleDemo icon within start menu, in case the application was installed via the installer package).

A device selection dialog will pop up similar to the following one and list all available devices:



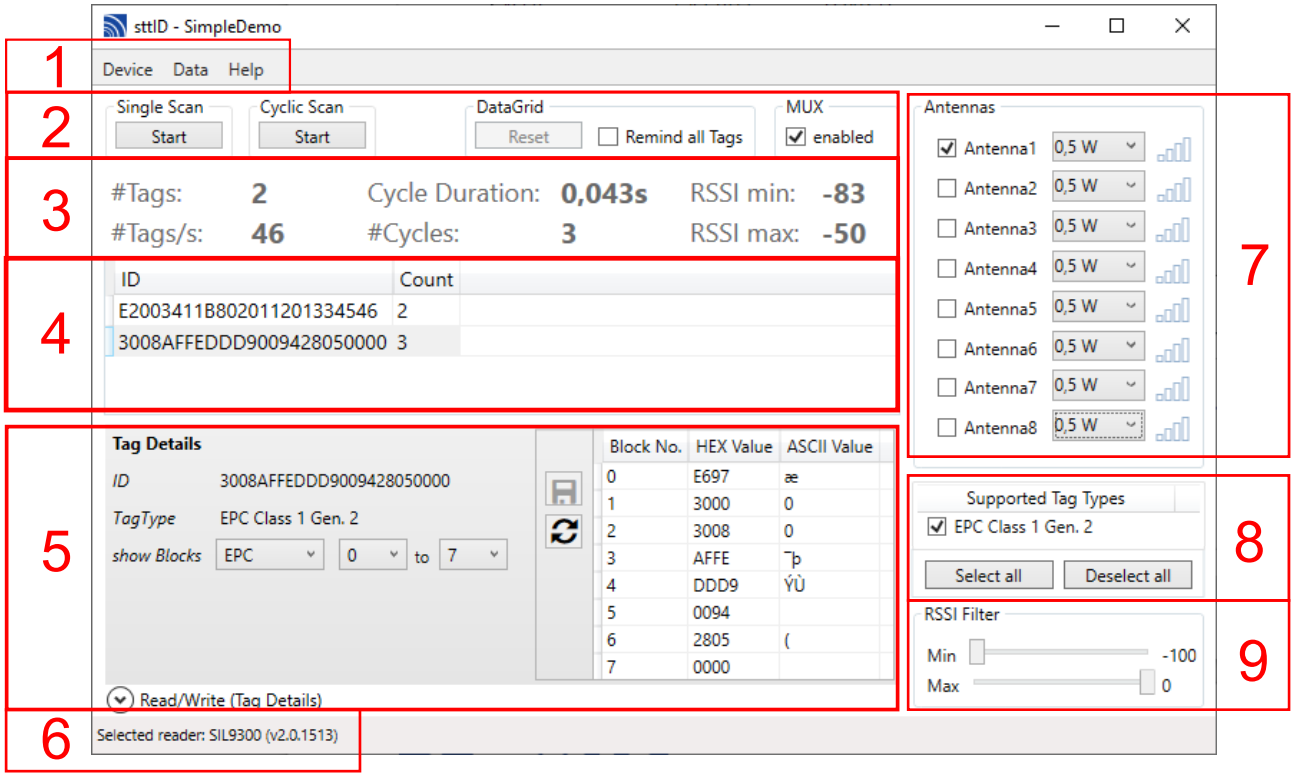
Picture 8: sttID device discovery dialog

Select your reader by clicking on its name or interface in the list and press the "Connect" button afterwards.

After 2 to 5 seconds the connection to the RFID device should be established.

6 Guide

6.1 Overview SimpleDemo main window



Picture 9: SimpleDemo main window, when connected to a reader. (The window's appearance may vary slightly depending on the connected reader's actual features.)

The application's main window is divided into following sections:

1 - Menu bar providing options for device selection, configuration and data export

2 - Control area. Start a scan process using the buttons found here.

3 - Statistic information about the tags found during scanning

4 - List of found tags

5 - Tag detail view giving more information about a selected tag in the list above. This view can be expanded/hidden. Use this area for reading or writing data blocks.

6 - Status line providing information about the connected reader

7 - Antenna configuration area

8 - Tag type selection area lists all tag types supported by the connected reader. You can disable types here, when interested only in particular types.

9 - RSSI filter control area

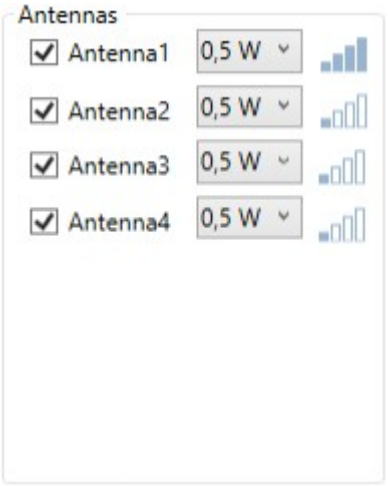
Following chapters will give you a more in depth description on these sections and how to use them.

6.2 Antenna configuration

The antennas which are supported by the connected reader are displayed at the right side. If the device can handle multiple antennas (multiplexing – MUX) then you can choose, which antenna ports you want to activate and set the power, which the reader is sending during a scan.

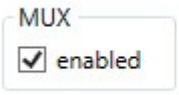
The indicator next to the power selector shows how good the antenna is tuned (on a port with an antenna it should be 3 or 4 bars). If multiplexing (MUX) is disabled, only one antenna can be selected.

Hint: For faster scanning cycles deselect all those ports, where no antenna is connected.



Picture 10: Antenna configuration section

Enabling/disabling multiplexing is done via the "MUX" checkbox in the control area.

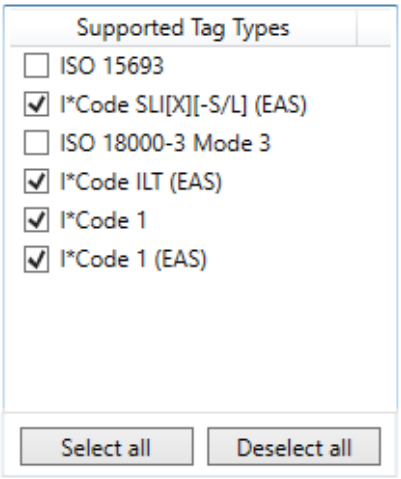


Picture 11: MUX enabled

6.3 Tag Type selection

All tag types are displayed in the "Supported Tag Types" section, which the connected reader can handle. It is recommended to select only those types you want to scan for, in order to improve the performance.

Hint: You can select/deselect all types with a single click, when using the corresponding buttons below the type list.



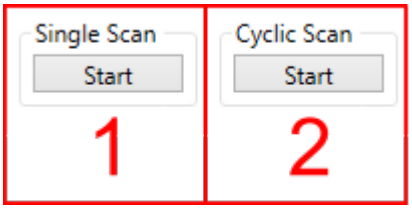
Picture 12: Supported tag type selection list

6.4 Single Scan/Cyclic Scan

There are two possibilities to scan for tags in range: “Single Scan” and “Cyclic Scan”.

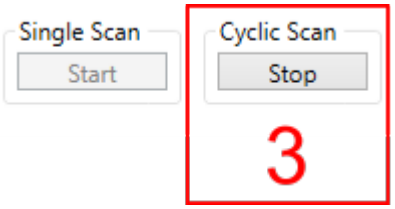
You start the scan process by clicking on one of the “Start” buttons in the control area: Use (**1**) in order to execute a single scan and (**2**) for a cyclic scan.

During a “Single Scan” ONE scan with all selected antennas is performed.



Picture 13: Start scan buttons

“Cyclic Scan” means that a “Single Scan” is repeated in an endless loop until the “Stop” button (**3**) is pressed.

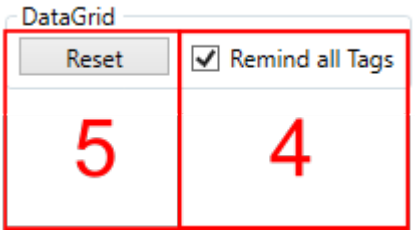


Picture 14: Stop cyclic scan button

During scans all found tags are shown in the tag list and the scan statistics are updated accordingly. By default the found tag list will contain only those tags found in the last scan cycle i. e. tags are removed, when found in a previous cycle but NOT in the last one.

However you can change this behaviour and also keep all the tags currently out of range in the tag list. In order to do so, tick the “Remind all Tags” control (**4**).

Once this control is marked checked, the “Reset” button (**5**) becomes active. You can press this button, when you like to to clear the tag list and reset the statistic values.



Picture 15: "Remind all tags" option is activated

6.5 Scan Result – List of found tags

Once a single/cyclic scan is being executed all the found tags will be listed in a table view like the one below:

ID	Count	TagType	block 0	block 1	block 2	block 3	ASCII	RSSI	A1	A2	A3	A4
E2003411B802011201334546	3	EPC Class 1 Gen. 2	5A12	3000	E200	3411		-74	☑	☐	☐	☐
0659AFFE0077AFFE02440000	3	EPC Class 1 Gen. 2	E4DF	3000	0659	AFFE		-63	☑	☐	☐	☐
300800003434039400000070	3	EPC Class 1 Gen. 2	38D2	3000	3008	0000		-71	☑	☐	☐	☐
3008AFFEDDD9009428050000	6	EPC Class 1 Gen. 2	E697	3000	3008	AFFE		-71	☐	☑	☐	☐
300800000000000000000075	3	EPC Class 1 Gen. 2	D8E1	3000	3008	0000		-77	☑	☐	☐	☐

Picture 16: Found tags list example

The following information can be shown in this DataGrid view:

Column Header	Description
ID	Unique identifier of the tag
Count	Number of successful scans
TagType	Type of the transponder
block <a>, block <b>, ...	Content of the specified data blocks in hexadecimal representation
ASCII	Content of the specified data blocks in ASCII representation. Any • symbol in the string stands for a “non visible” character (hex value < 0x20). Any ⚠ symbol indicates a missing character due to blocks, which were not read successfully.
RSSI	RSSI value for the tag
A1, A2, ...	“A” stands for “antenna”. The box has a blue background, if the tag was scanned by this antenna since the last reset. If the box is checked, this antenna was the last which scanned the tag.

By default only columns “ID” and “Count” are shown in the tag list, but you can customize this view by enabling additional columns via a context menu.

Just right click into tag list area in order to make this context menu pop up. You will find all available columns with a checkbox in front for enabling/disabling it.

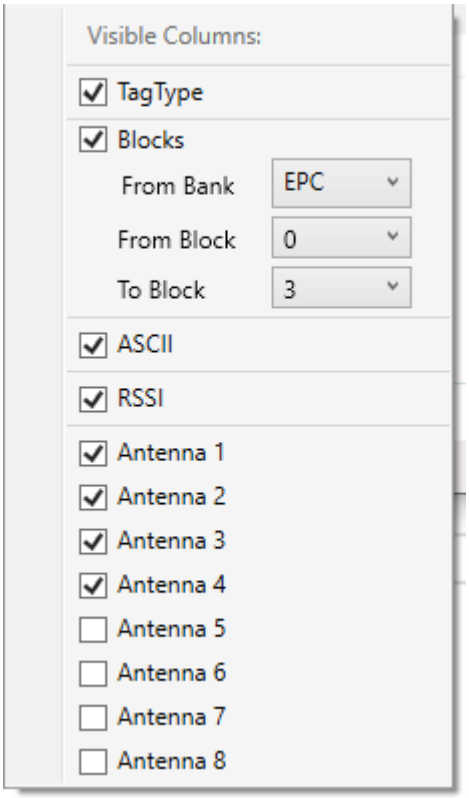
For data blocks you need to choose the memory bank and start/end block index in addition.

Remarks:

Appearance of the context menu may vary depending on the features of the connected reader.

Columns “ID” and “Count” cannot be disabled.

The tag list view is supposed to show only an area within the tag’s first 50 data blocks. Refer to the tag details view instead, when you need to show more or an area beyond the first 50 blocks.



Picture 17: Context menu sample of tag list view

6.6 Read data blocks

There are two ways to display the data, which is stored in the tag’s memory.

a) Display blocks in the main data grid

This method is recommended, if you want to read the blocks of all tags in range. In this case it is not necessary, that the tag is already scanned.

Use the data grid’s context menu in order to make block columns visible and select the memory bank and block area (“From Block” and “To Block”) you want to see.

If you want the values encodes as ASCII, you need to enable the ASCII column as well.

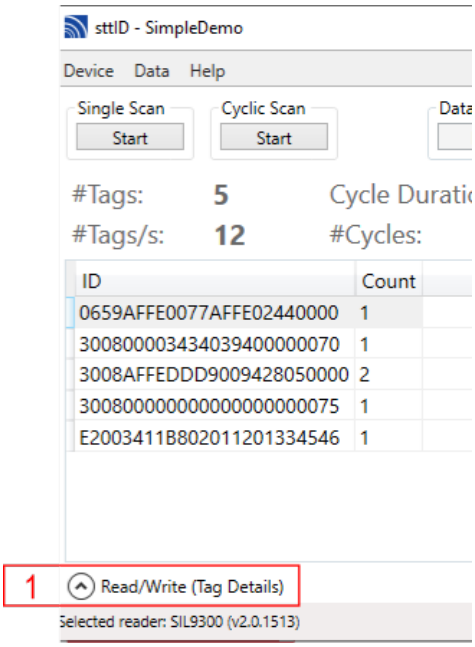
During the next scan the reader tries to get the content of the specified blocks.

Attention: *This method increases the duration of the scanning cycles, because blocks of all tags in range will be read!*

b) Using the “Tag Details” section

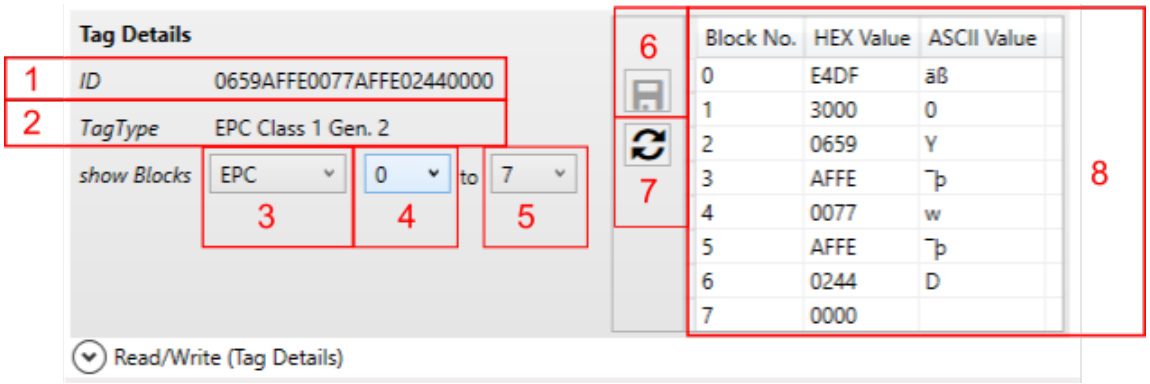
This method is recommended, if you want to read the blocks of some single tags. It is necessary that the tag was scanned already.

You can open the “Tag Details” view either by double-clicking on a tag in the DataGrid or by clicking on “Read/Write (Tag Details)” (1) and selecting a tag from the list.



Picture 18: Tag details area is hidden

“Tag Details” area will then expand to a view like the following:



Picture 19: Tag details area is expanded

It contains the following elements:

1 - Unique identifier of the tag

2 - Tag type

3 - Selection list with all available memory banks. This list will be hidden in case the tag only provides a single memory bank.

4 - Selection list for the start block of the area you want to see.

5 - Selection list for the end block of the area you want to see.

6 - Save button. Click it in order to write modified block data into the tag.

7 - Refresh button. Click it in order to read the block values again.

8 - Data blocks view showing the block number and the data in hexadecimal and ASCII representation.

6.7 Write data blocks

- To write data, first follow the steps described in Chapter 6.6 option **b)** to open the "Tag Details" section.
- If the tag data is displayed in the small grid (**8** in Picture 19 above), HEX or ASCII values can be edited by double-clicking on a cell.
- Click on the save button ( ) to write changed values to the tag memory.

6.8 CSV Export

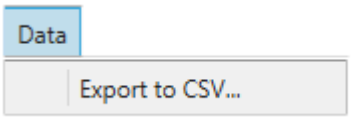
The data listed in the main data grid can be exported to a *.csv file.

Hint: *All currently visible columns are saved to the file.*

Select "Export to CSV…" within the "Data" menu found in the menu bar at the top of the window.

You will be prompted to choose a destination folder and a file name.

Click "Save" to write the data to the specified file.



Picture 20: Menu "Data/Export to CSV ..."

6.9 Scan Statistics

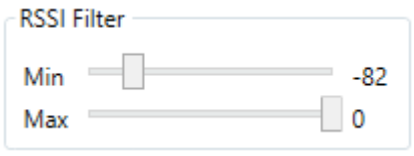
Picture 21: Statistics information sample

The statistic information section located above the found tag list provides following values:

1 - Total number of tags read.
2 - Average number of tags read per second.
3 - Average cycle duration.
4 - Total number of cycles performed.
5 - Minimum RSSI value observed for a tag.
6 - Maximum RSSI value observed for a tag.

6.10 RSSI Filter

RSSI filtering area is available only when a reader supports the EPC Class1 Gen.2 tag type. Use the sliders here to define a minimum and maximum value for the signal strength. Found tags with signal strength beyond that given range will be discarded after scan and are not included in the result list.



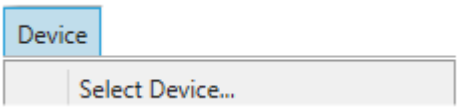
Picture 22: RSSI Filter controls

Note: The minimum value corresponds to the reader's internal RSSI filter setting.

7 Menu “Device”

7.1 Connect to (other) device

You can reconnect to a device in case the connection was lost or connect to an other reader by using the “Select Device …” menu option within the “Device” menu.



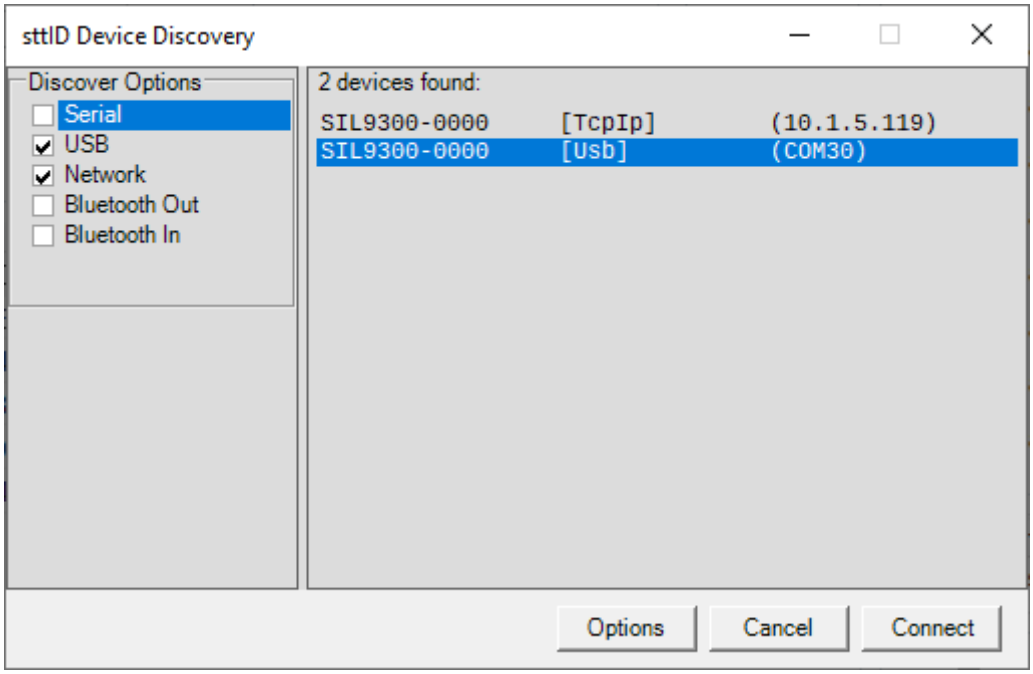
Picture 23: Menu "Device/Select Device ..."

The device discovery dialog, you know already from SimpleDemo start, will show up here as well.

Hints:

Click on Button “Options” in order to activate the “Discovery Options” panel. It allows you to filter the available devices by interface type (Serial, USB, Network, …). This can be useful e.g. when a lot of devices were discovered and the favoured device is hard to look up in a long result list.

Disable the interface type(s) you are not interested in and all corresponding entries in the found devices list will disappear.



Picture 24: sttID device discovery dialog with discovery options activated

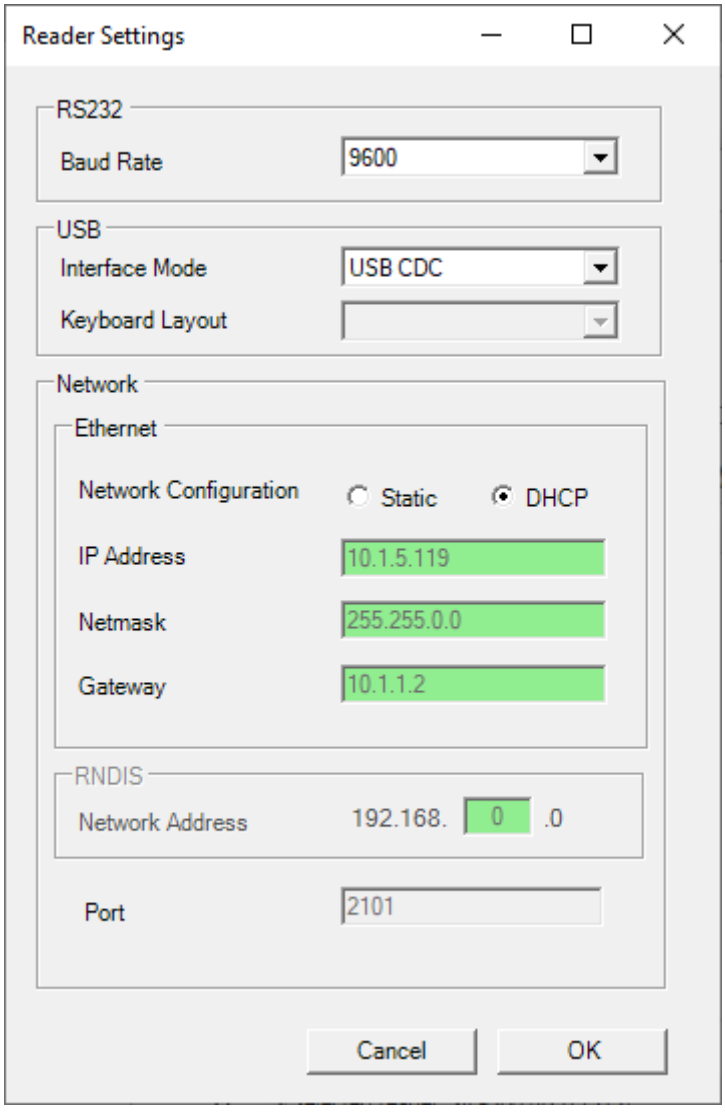
You can hide “Discovery Options” panel by clicking on “Options” once again.

7.2 Configure device’s interface settings

Menu option “Interface Settings …” in menu “Device” allows you to modify the interface configuration of your scemtec RFID device. When executing this menu option, a dialog window will show up containing a section for each interface your device supports. Here you can spe-

cify:

- the baud rate for RS232 interface
- the interface mode (CDC, HID, TCP/IP) and keyboard layout on HID mode for USB interface
- either static IP address values or DHCP configuration for network interface
- for WiFi: SSID and password of the WiFi station to connect to



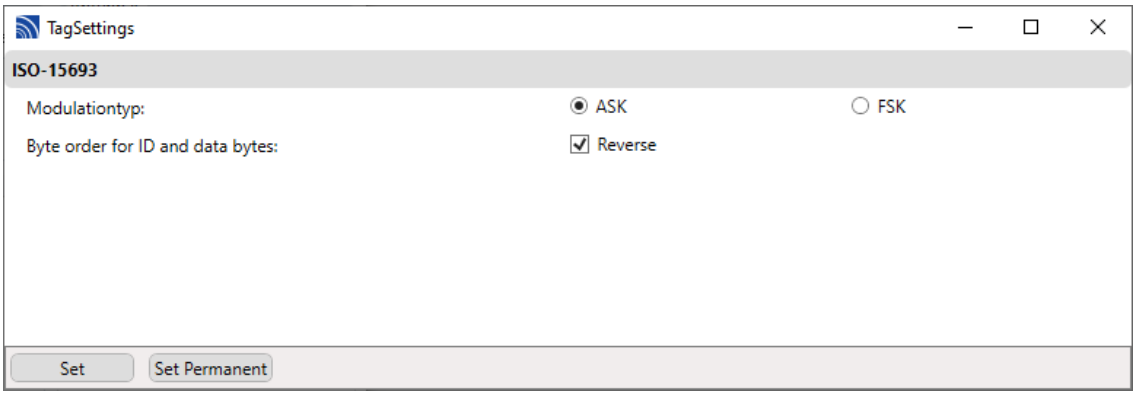
Picture 25: Interface settings dialog sample

7.3 Configure transponder settings

Menu option “Transponder Settings …” within menu “Device” can be used to adjust settings for specific transponder types.

For the ISO-15693 tag type you can specify:

- ASK or FSK as modulation type
- the byte order for tag ID and data bytes (i.e. reverse byte order or not)



Picture 26: Transponder settings for ISO-15693

Press the “Set” or “Set Permanent” button in order to apply your modifications to the reader. When using “Set” the changed settings will be lost as soon as the reader is reset or switched off. Use “Set Permanent” instead, when you want to keep your modifications after device re-start.

7.4 Restore Factory Settings

Use Menu “Device/Restore Factory Settings” when you want to set your scemtec RFID device’s configuration back to factory defaults.

Picture 27: “Restore Factory Settings” menu options

There are two options you can choose from:

- **Permanently**: Factory settings are restored as system configuration and also saved as default settings i.e. these settings will be loaded now, when reader is reset or on power on.
- **Temporary**: Factory settings are restored as system configuration. It be kept as long as the reader is not reset or powered off.

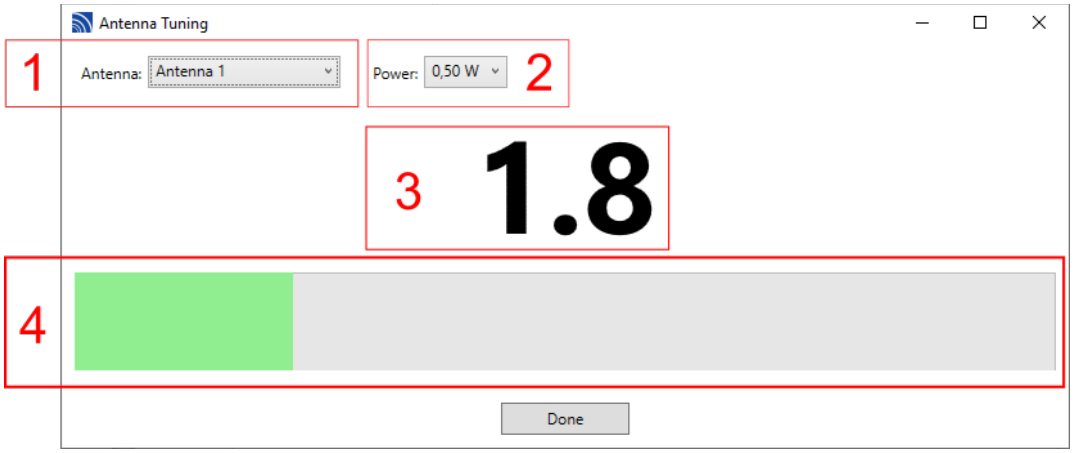
7.5 Restart Device

You can restart the device via the “Device/Restart Device …” menu option.

7.6 Antenna Tuning

Menu option “Device/Antenna Tuning ...” is only available for those scemtec RFID devices, which support performing a field analysis by calculating standing wave ratio (SWR) values.

Following window will pop up, when you execute this menu option:



Picture 28: Antenna tuning window

Select the antenna you want to tune from the list (**1**) and choose a power step (**2**). The current SWR value is continuously updated at (**3**) and will therefore give you permanent feedback on your tuning work. Furthermore the gauge (**4**) indicates the quality of the SWR value (the less it is filled the better.) Its colour will change from green(=good) over yellow to red(=bad), when SWR value rises.

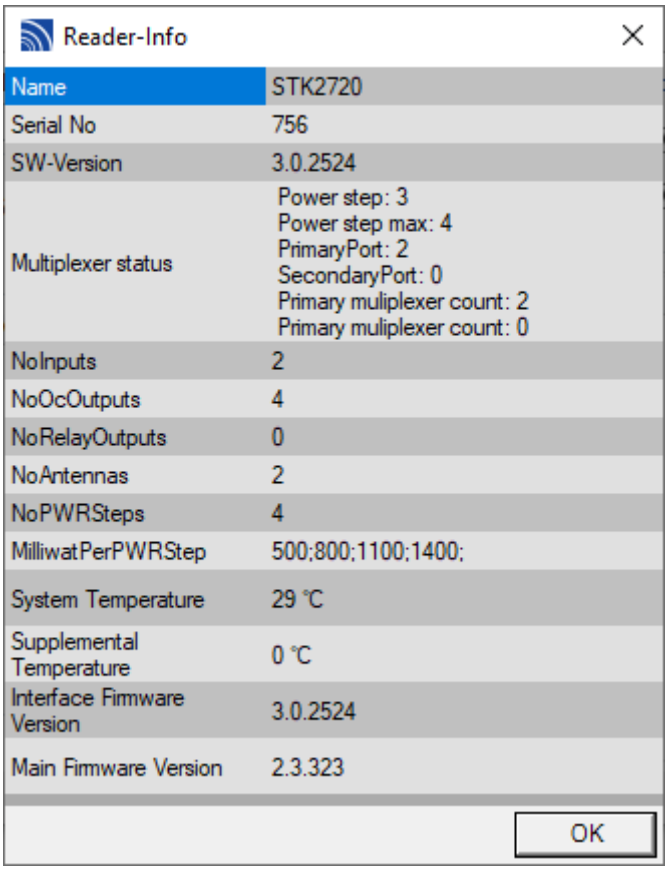
7.7 Reader Informations

You can gather more detailed information about the connected reader via the “Device/ Reader Information ...” menu option.

An info window will pop up providing following kind of data:

- Device name
- Serial number
- Version number of installed software(s)
- Number of antenna ports, inputs and outputs
- Power step information
- Current system temperature
- Multiplexer status
- Battery charging status

Note: The kind of provided information may differ from device to device and depends on the device’s features.



Picture 29: Reader info sample

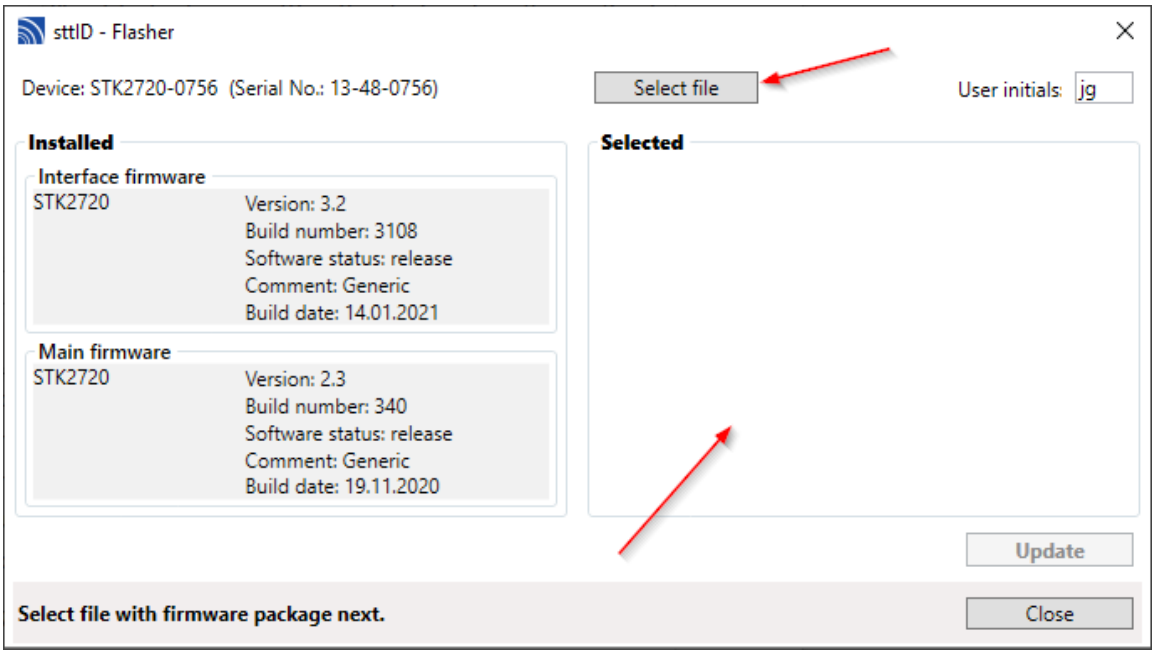
7.8 Firmware Update

You can install a new reader firmware via the “Device/Firmware Update …” menu option. Latest firmware files are available for download on www.stt-rfid.com.

Be aware that a firmware installation must be performed with the reader connected via USB interface.

Remark: Menu option “Firmware Update” is not available for particular readers, where firmware installation is performed via web interface solely (e. g. SIL-9400). Refer to the reader’s manual for firmware installation instructions instead then.

When clicking the “Firmware Update …” menu, sttID Flasher dialog will open:

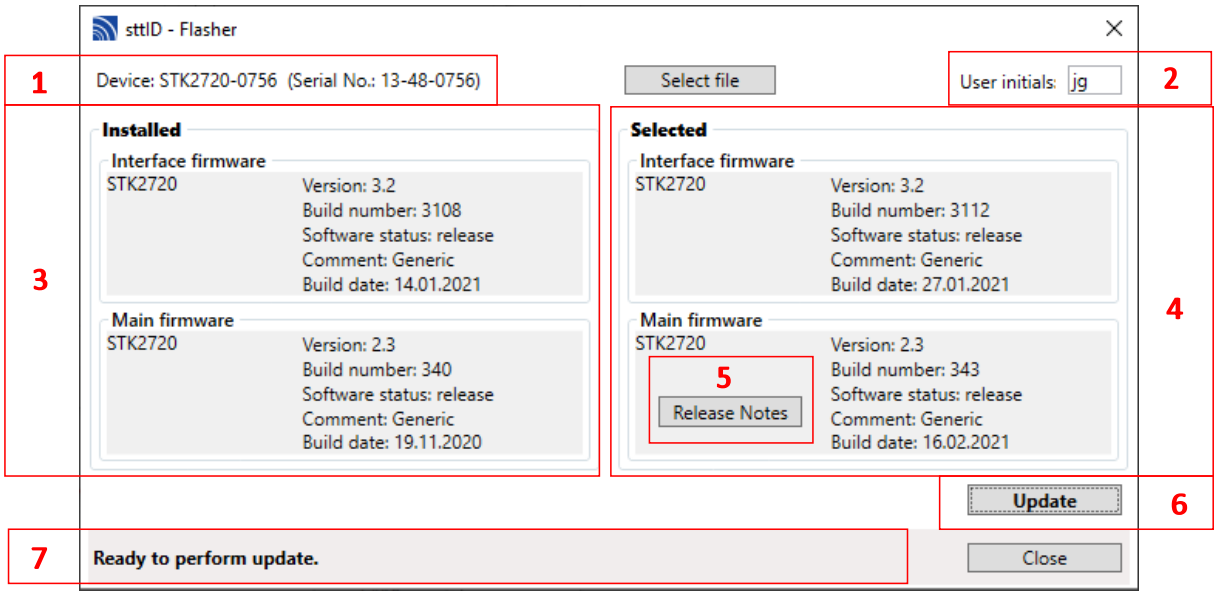


Picture 30: sttID Flasher dialog showing installed firmware

Choose the firmware package to install either by

- Clicking button “Select file”: A file selection dialog opens then. Use it in order to navigate into the directory where the firmware package is located and select the firmware file.
- Or just drag the firmware file and drop it into the area named “Selected”.

Flasher dialog will display currently installed and new firmware side by side then:



Picture 31: sttID Flasher dialog with new firmware selected for installation

Flasher dialog consists in detail of following elements:

1 – Name and serial number of the device currently connected

2 – Initials of the user performing the firmware installation. The field is preset with initials of

current Windows user running SimpleDemo application, but can be edited and adapted when needed. User initials value will be stored on the device together with the new software.

3 – Version information for all firmware component parts installed. The actual list content here may vary depending on the reader's hardware.

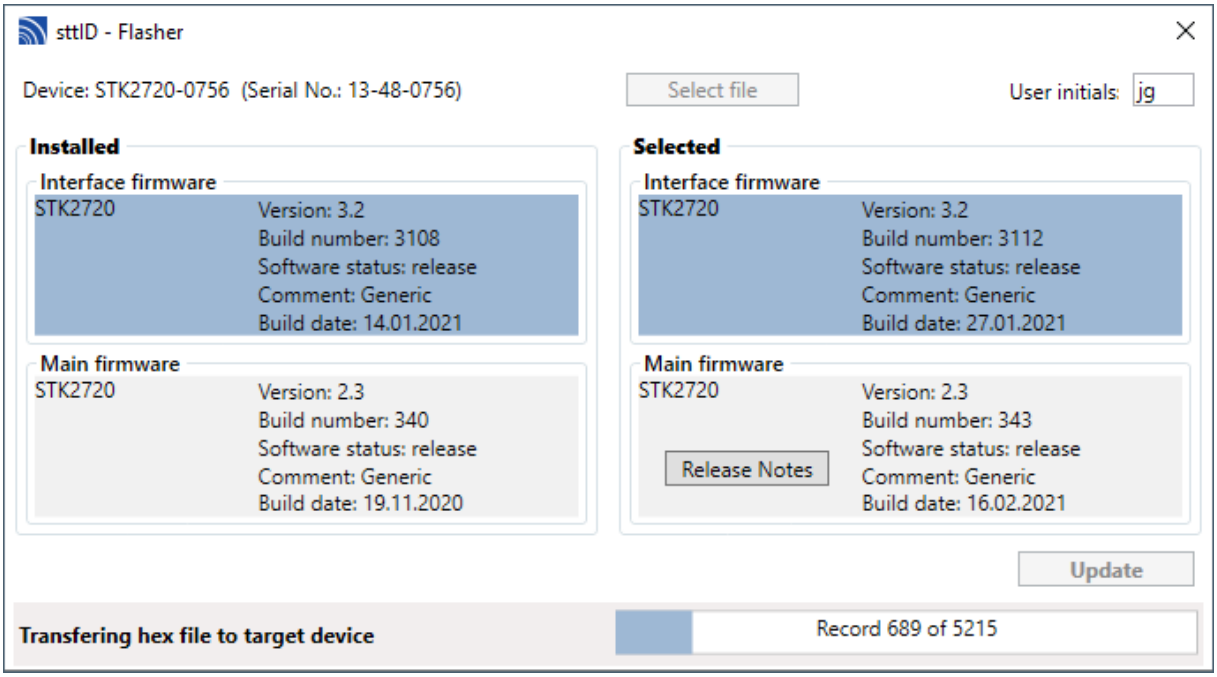
4 – Version information for all new firmware components selected for installation

5 – Use this button (when available) to display a text file with release information coming with the selected firmware package

6 – Button used to start the firmware installation procedure

7 – Area showing current progress and status of the firmware installation

Start firmware installation by pressing button "Update" (**6**). Firmware component parts will be installed one after the other then; the currently processed firmware part gets highlighted:



Picture 32: sttID Flasher dialog while firmware installation is in progress

Hint: Depending on the particular reader and installed software you may be prompted to reconnect to the device during the installation process.

Leave the dialog by clicking button "Close", when installation is finished.

8 General hints

- Your configuration (selected antennas, power steps, enabled tag types, visible columns in DataGrid etc.) is kept after exiting SimpleDemo and will be restored on next start, when you connect to the same device. It will get lost however, if you connect to a different reader meanwhile.
- You cannot edit data blocks, when the blocks range contains “empty blocks” i.e. blocks, which were not read successfully before. Use the refresh button first in order to read the block range again.