UM2444
User manual

Software toolbox for NFC tags

Introduction

ST25PC-NFC (part number STSW-ST25PC001) for Windows® is the reference software developed by STMicroelectronics for the ST25 NFC / RFID Tags. It relies on the publicly available Java™ ST25 SDK.

This document aims to help the user understand how to install and use the software.

ST25PC-NFC operates with STMicroelectronics NFC products belonging to the M24SR, M24LR, ST25DV-PWM and ST25DV-I2C series Dynamic NFC Tags, and ST25Tx series (NFC tags).

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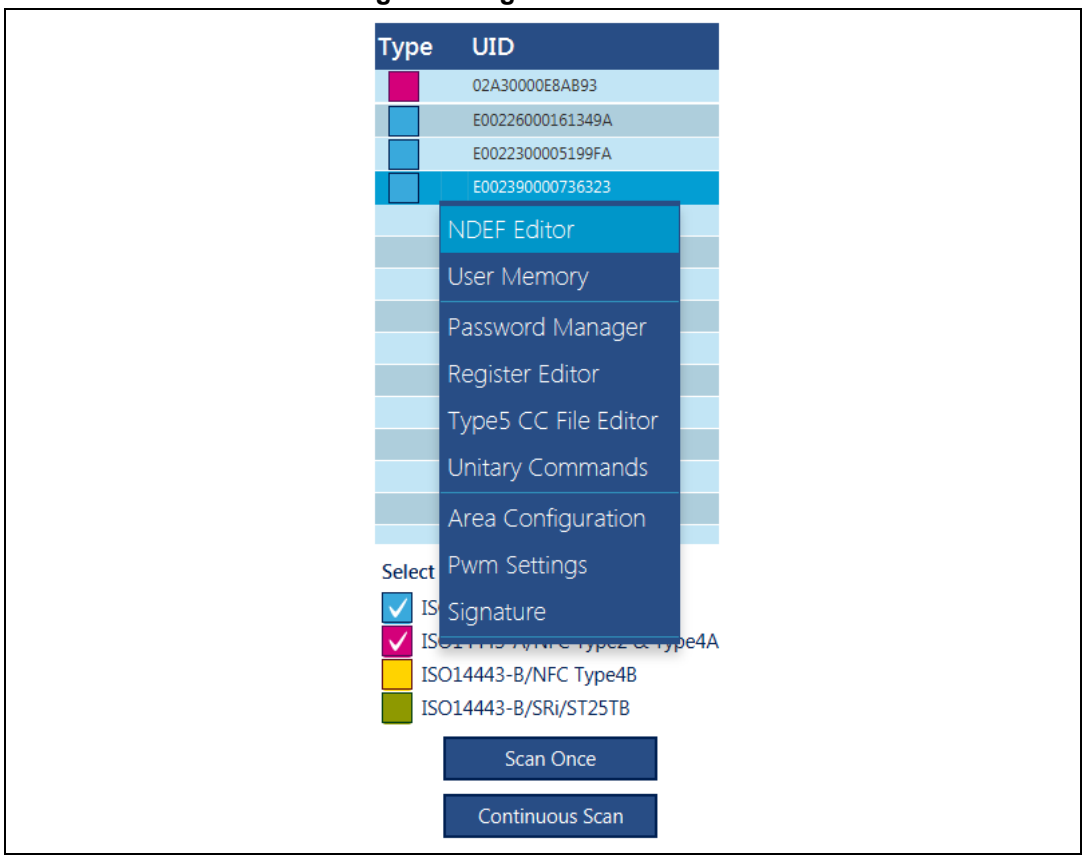
1 Quick start

Once the software is installed (see *Section 3: Installation*), connect your USB reader from the supported list (see *Section 2.1: Supported readers*) and launch the ST25PC-NFC program.

To detect tags, place them in the RF field generated by the reader and hit the *Scan Once* button for a 1-shot run of anti-collision sequence for the selected protocols.

From the *Tag Inventory* table, the user can right-click on an item to launch all available actions for the selected tag and follow the instructions on the display.

Figure 1. Tag contextual menu



2 Features

The ST25PC-NFC software is based on the Java™ ST25 SDK.

It can be used with all readers supported in the SDK:

- ST demonstration boards for CR95HF and ST25R3911B-DISCO
- FEIG ELECTRONIC readers: MR102, LR1002 and CPR30-USB

Depending on the reader capabilities, ST25PC-NFC software detects tags from the following protocols and displays basic tag information:

- ISO 15693
- ISO 14443-A
- ISO 14443-B
- ISO 14443-B SR protocol for ST25TB series
- NFC Forum Type 5
- NFC Forum Type 4A
- NFC Forum Type 4B
- NFC Forum Type 2

Generic features include:

- EEPROM content editor:
  - Display memory content
  - Write bytes of memory
  - Save to/Load from file
- NDEF builder:
  - Read/Write NDEF message from/to tag
  - Add/Delete records to/from the NDEF message
- Capability Container File editor:
  - Type 4 CC File reader
  - Type 5 CC File read/modify
- Password manager:
  - Open sessions protected by password
  - Set value for all passwords
- Register editor:
  - Read and display all register values from the system area
  - Write new values (requires good password presentation)
- Unitary RF commands:
  - ISO 15693 and ST proprietary command builder
  - ISO 14443-A / Type 4A commands

In addition to generic features, all specific features of ST25 tags are available in specific menus. For example:

- ST25DV-I2C:
  - Fast Transfer Mode
  - Multi area editor and area configuration
- ST25DV-PWM:
  - PWM settings
- ST25TV:
  - Tamper Detect
  - Counter
  - Electronic Article Surveillance
  - Untraceable Mode
- M24LR series:
  - Sector management
- ST25TA series
- M24SR series
- ST25TB SRi/SRT series

Another menu called *Demos* allows the user to directly access specific demonstration tools:

- Fast Transfer Mode demonstrations with ST25DV-DISCOVERY boards
- NFCSensorTag demonstration of STEVAL-SMARTAG1 (information about the NFC dynamic SensorTag evaluation board is available on *www.st.com*)
- Pulse Width Modulation demonstration of the ST25DV-PWM-eSet board

Finally, a console displays all RF communication between the RF reader and the tags.

The ST25PC-NFC software is constantly evolving, check *www.st.com* regularly for updates.

2.1 Supported readers

The following NFC/RFID readers are supported:

- STMicroelectronics
  - CR95HF evaluation board
  - ST25R3911B-DEMO board
- FEIG ELECTRONIC
  - OBID MR102 (ISO 15693 only)
  - OBID LR1002 (ISO 15693 only)
  - OBID CPR30-USB

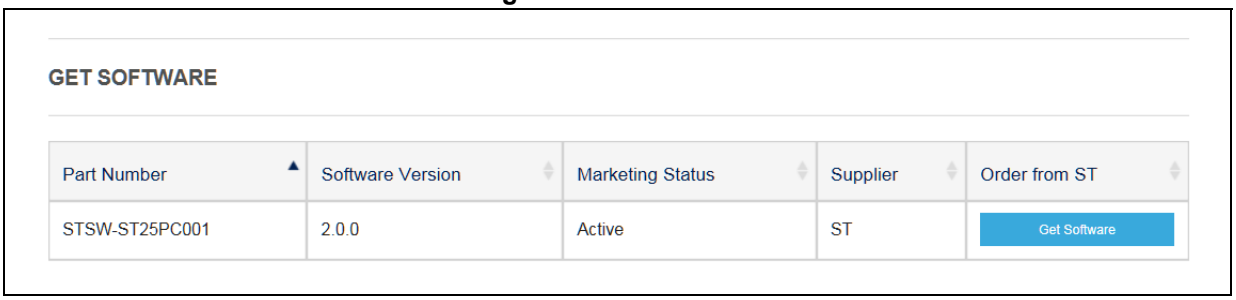
3 Installation

3.1 Download

The ST25PC-NFC.exe Windows installer file can be found on the ST website.

Click on the *Get Software* button at the bottom of the page, then accept the license agreement.

Figure 2. Get software



3.2 Running the installer

Launch the installer program and follow the instructions. First, accept the agreement and click on the Next button, you will be asked for an installation folder, the default directory is *C:\Program Files (x86)\STMicroelectronics\ST25PC-NFC*. You can change this directory by clicking on the Browse button. Once done, click on Next.

During the installation, you will be prompted to install MSVC++ 2017 redistributable if not already on your PC. You will also be given the option to install FEIG reader USB drivers.

At the end of the process, the software can be launched (check the box to start the program).

Figure 3. License agreement

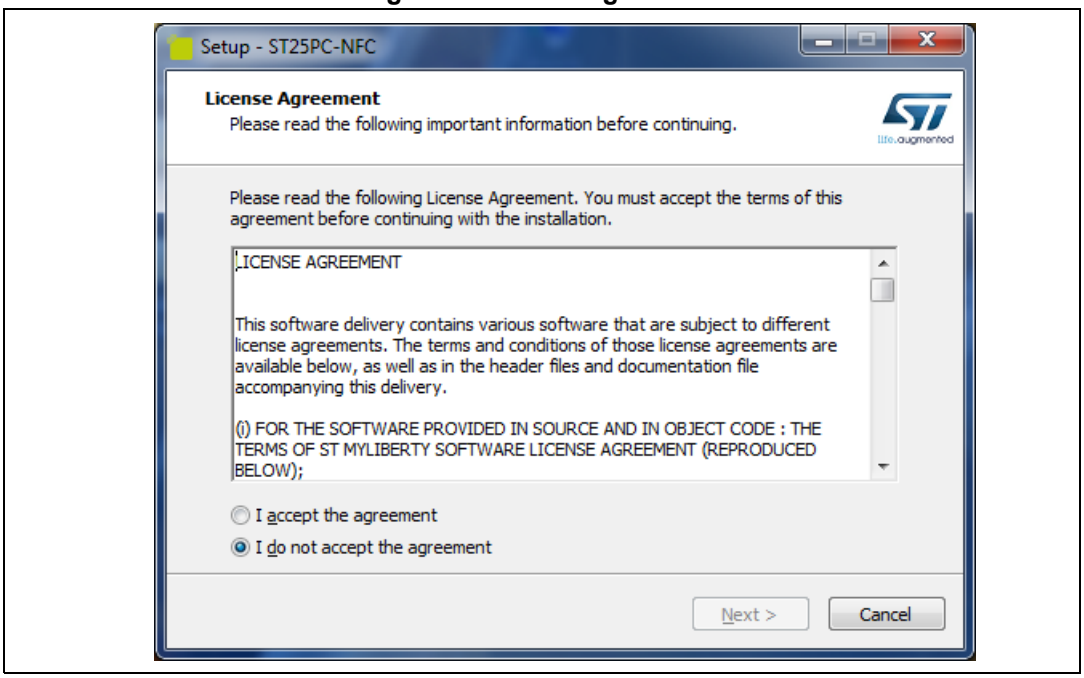


Figure 4. Install folder

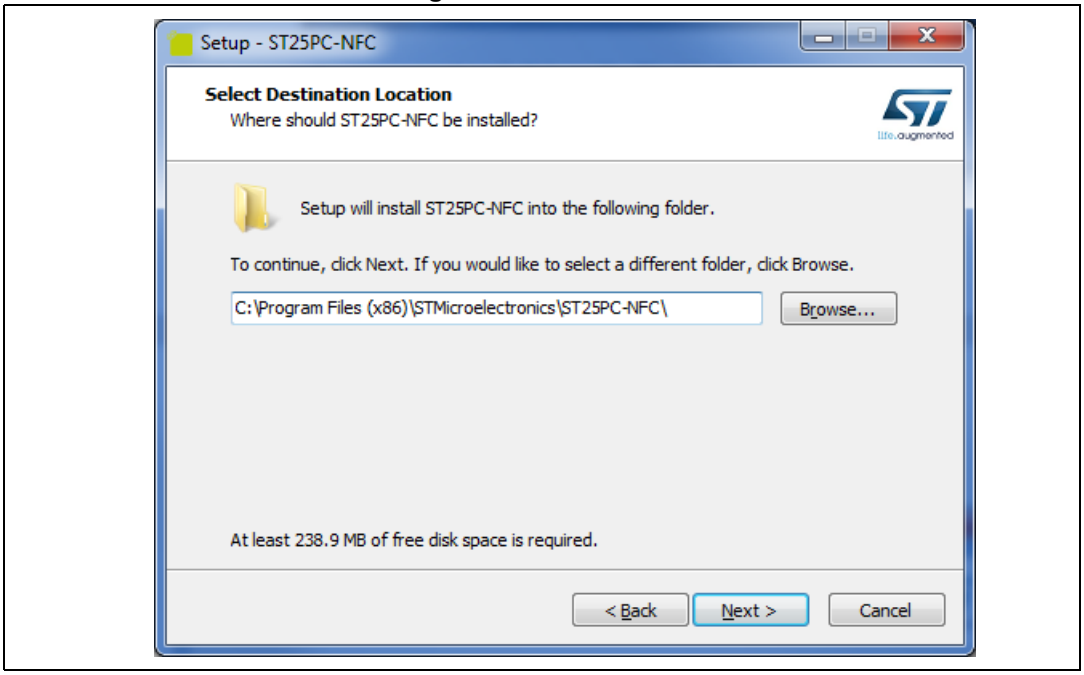
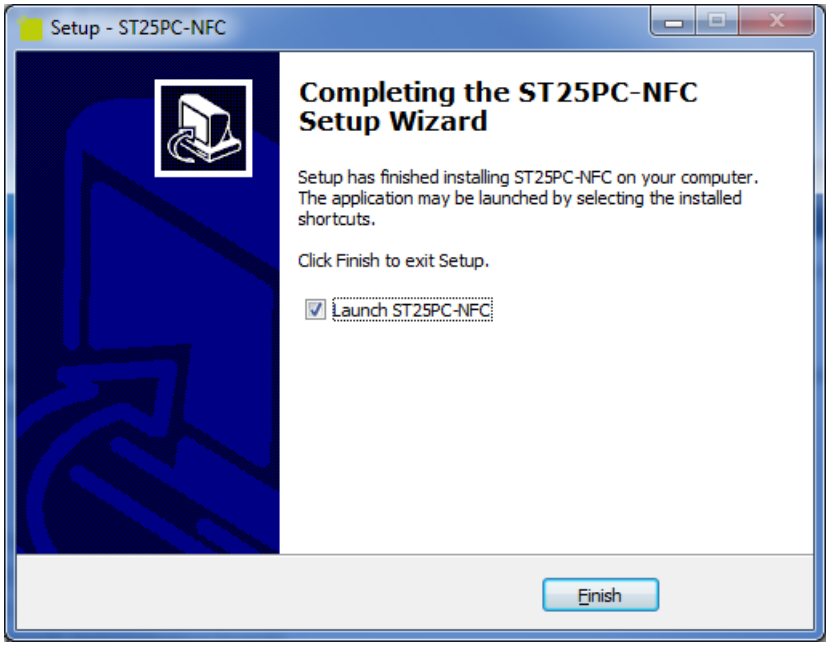


Figure 5. Installation completed



3.3 Upgrading for TruST25™ features

The public version of ST25PC-NFC is freely available on *www.st.com*.

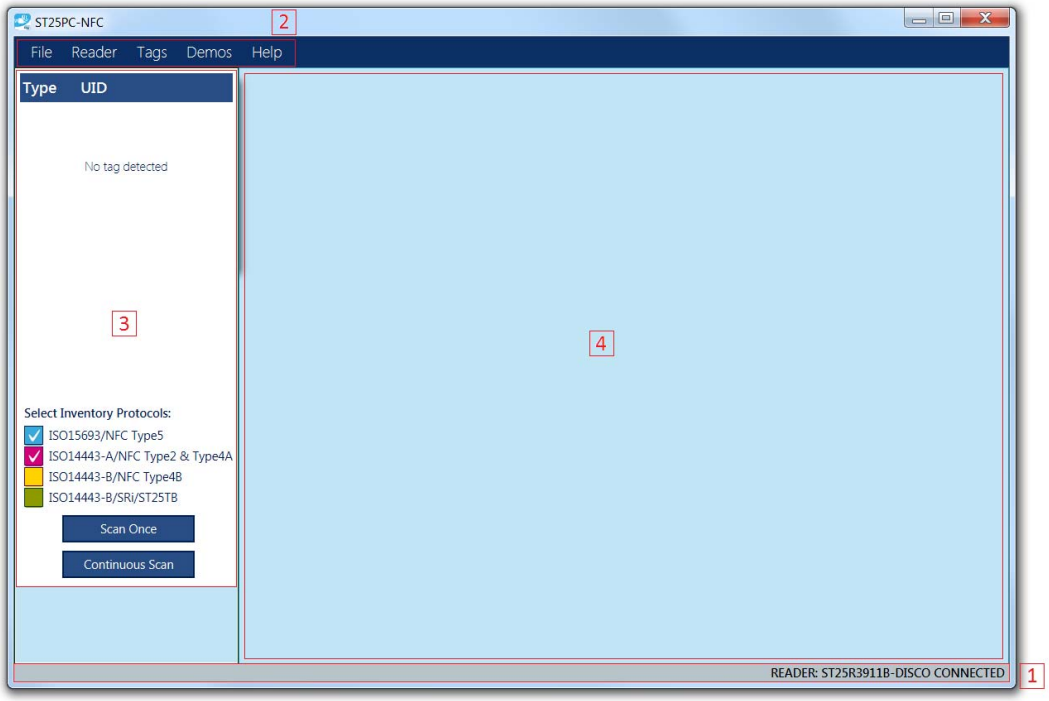
To benefit from the extra TruST25™ security features, contact your local ST office. and sign a Non-Disclosure Agreement (NDA). Once in place, you will receive a new version with all features available.

4 GUI overview

As shown in *Figure 6*, the ST25PC-NFC main window can be divided in four parts:

1. Reader information area [1], indicating the RF reader being used
2. Inventory area [3], displaying tags present on the RF reader antenna
3. A top menu [2], used to select features and tools
4. The main area [4], displaying tabs from selected features and tools

Figure 6. ST25PC-NFC main window

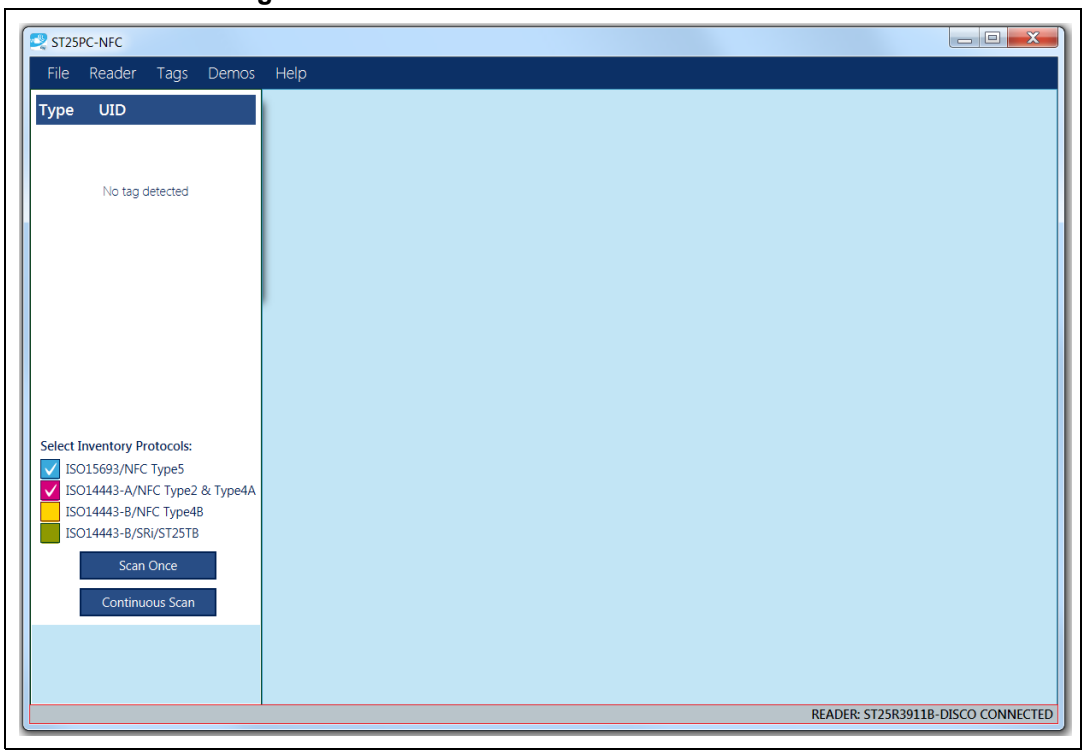


4.1 Application start

When starting the ST25PC-NFC software, the application will automatically try to detect an RF reader connected to your computer. This RF reader must be one supported by the software (see list of supported RF readers in *Section 2.1: Supported readers*).

The status bar at the bottom of the application (part [1] of *Figure 6*) indicates the name of the connected reader. *Figure 7* is an example, the ST25R3911B-DISCO board is detected.

Figure 7. ST25R3911B-DISCO RF reader detected



If no reader is connected, a warning message will appear (*Figure 8*) and the bottom connection status bar will be shown in red, with the warning NOT CONNECTED (*Figure 9*).

Figure 8. No RF reader detected

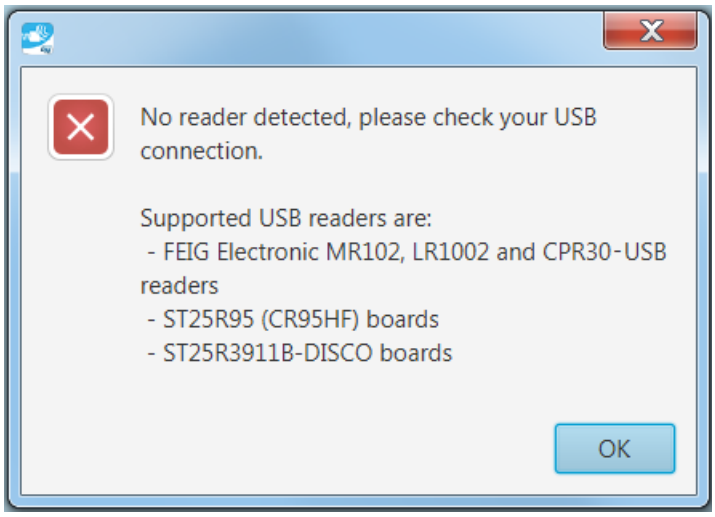
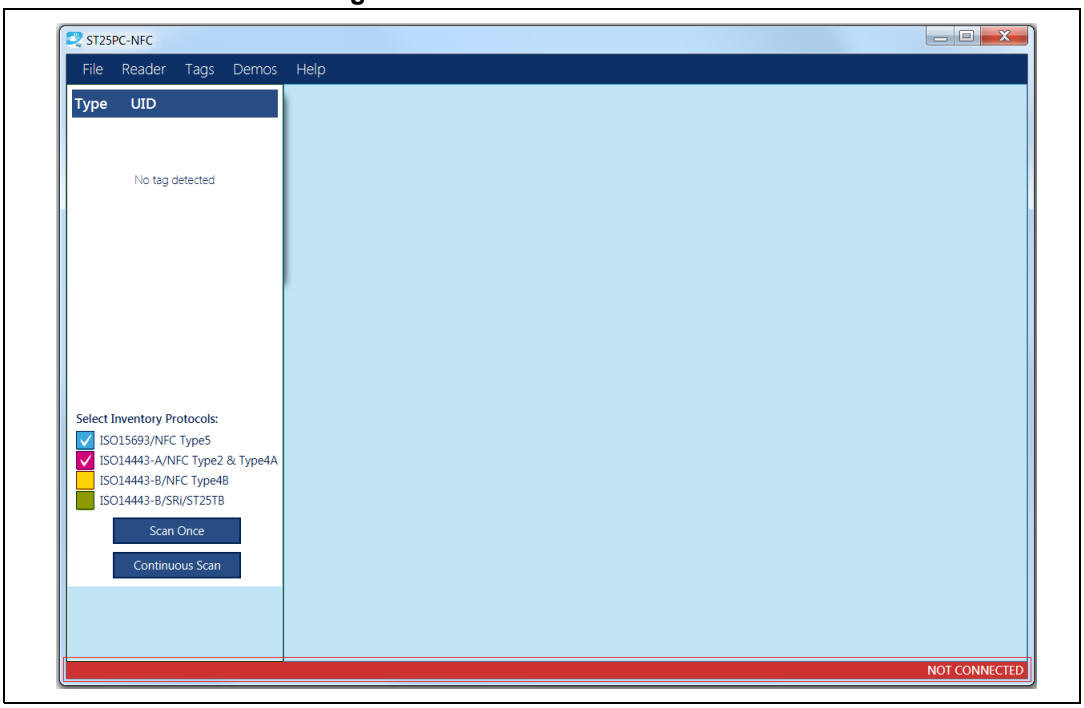


Figure 9. No RF reader is detected

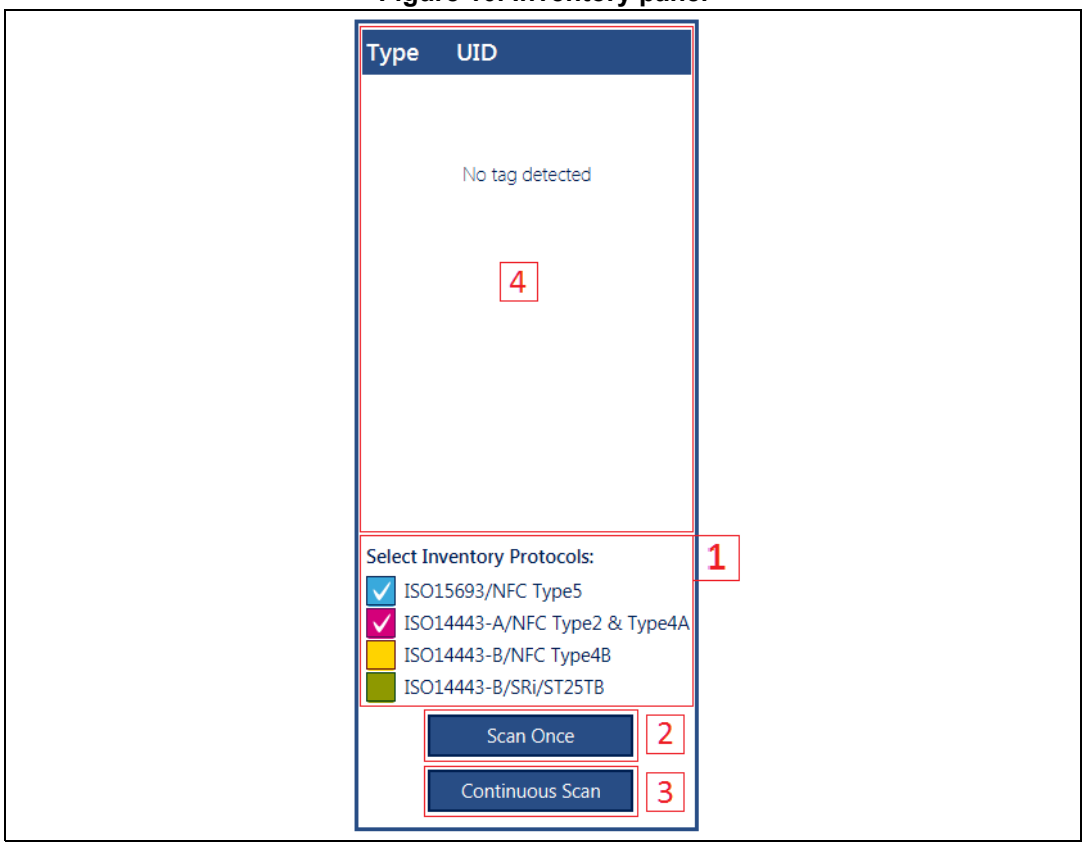


As soon as an RF reader is detected, the inventory process is launched and the detected tags are displayed on the left (part [3] of *Figure 6*).

4.2 Inventory panel

The Inventory panel (*Figure 10*) is located on the left side of the main screen. It displays tags that are detected by the anti-collision protocols implemented by the reader. By default, the ISO 15693 / NFC Forum Type 5 and ISO 14443-A / NFC Forum Type 2A and 4A protocols are selected.

Figure 10. Inventory panel



Part [1] of *Figure 10* indicates the different RF protocols that can be included in the anti-collision process. Available RF protocols are:

- ISO 15693 / NFC Forum Type 5
- ISO 14443-A / NFC Forum Type 2A and 4A
- ISO 14443-B / NFC Forum Type 4B
- ISO 14443-B Sri / SRT/ST25TB

Check-boxes allow the user to select the protocol to launch once the Inventory process starts.

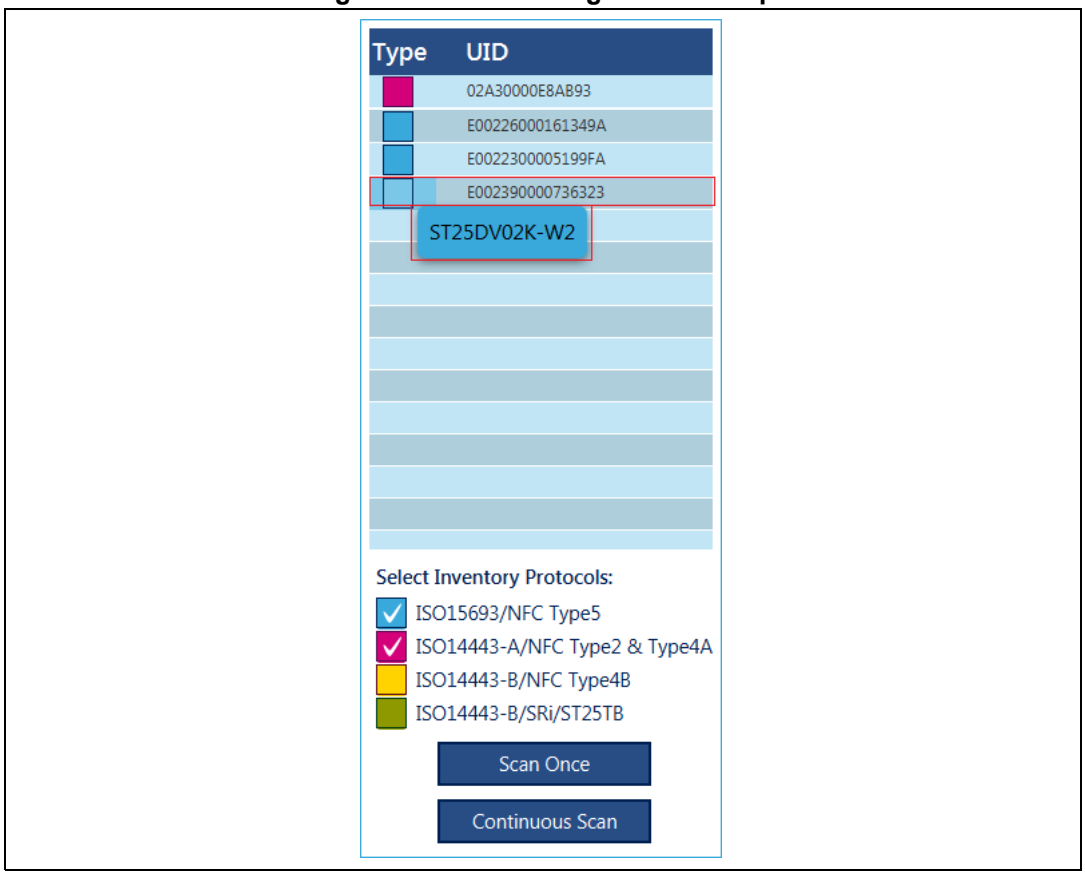
To detect tags, place them in the RF field of the reader and make sure the correct protocol is selected. The user can select one to four protocols (anti-collision sequences will be executed sequentially) by clicking on the check-boxes.

Using the *Scan Once* button [2] will execute the detection only once. Choose *Continuous Scan* [3] to cycle through the protocols indefinitely (or until you press on the *Continuous Scan* button again).

Once the anti-collision process is terminated, the UID of the detected tags are displayed in the table (Part [1] of *Figure 10*).

A tool-tip displays the tag name when hovering on the selected row (*Figure 11*).

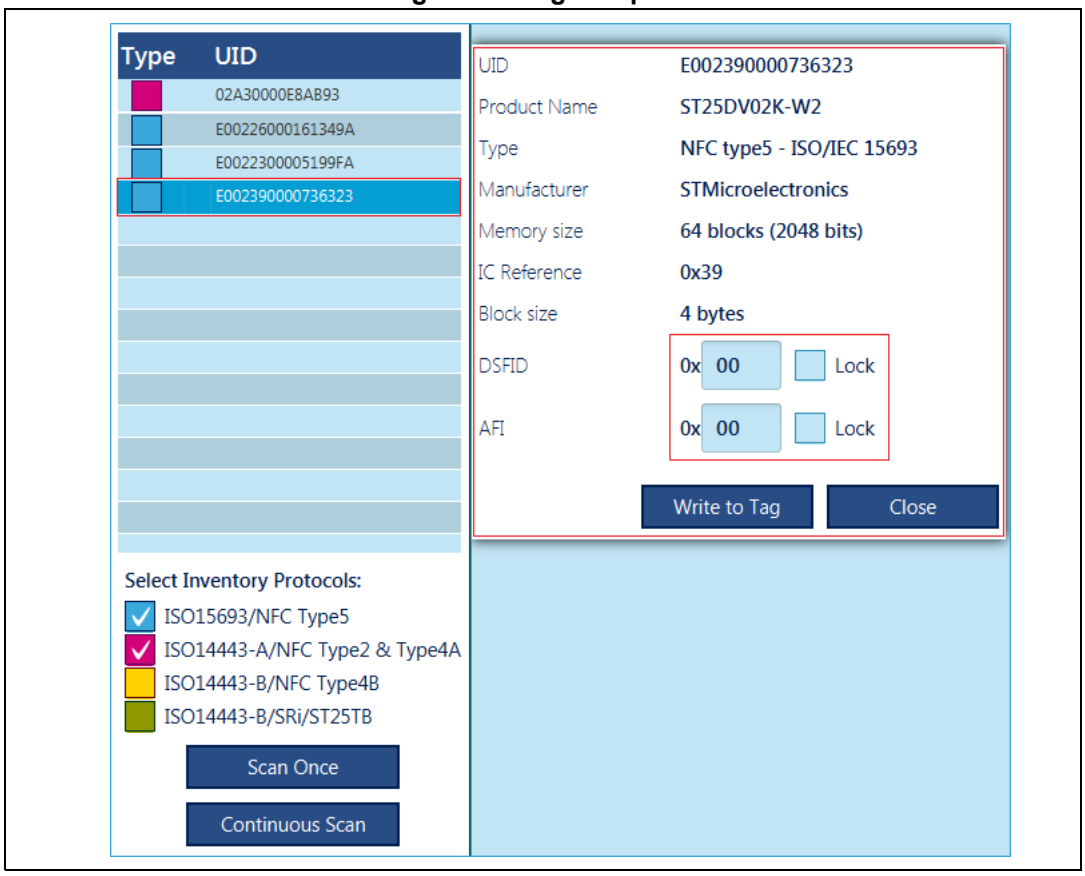
Figure 11. Detected tags with tool-tip



4.2.1 Tag info panel

To get more information about a given tag in the table, left-click on the desired row. An information panel will slide out that gives more details about the tag. UID, product name and type (RF protocol family) will be displayed. Depending on tag type, additional information will be displayed.

Figure 12. Tag info panel

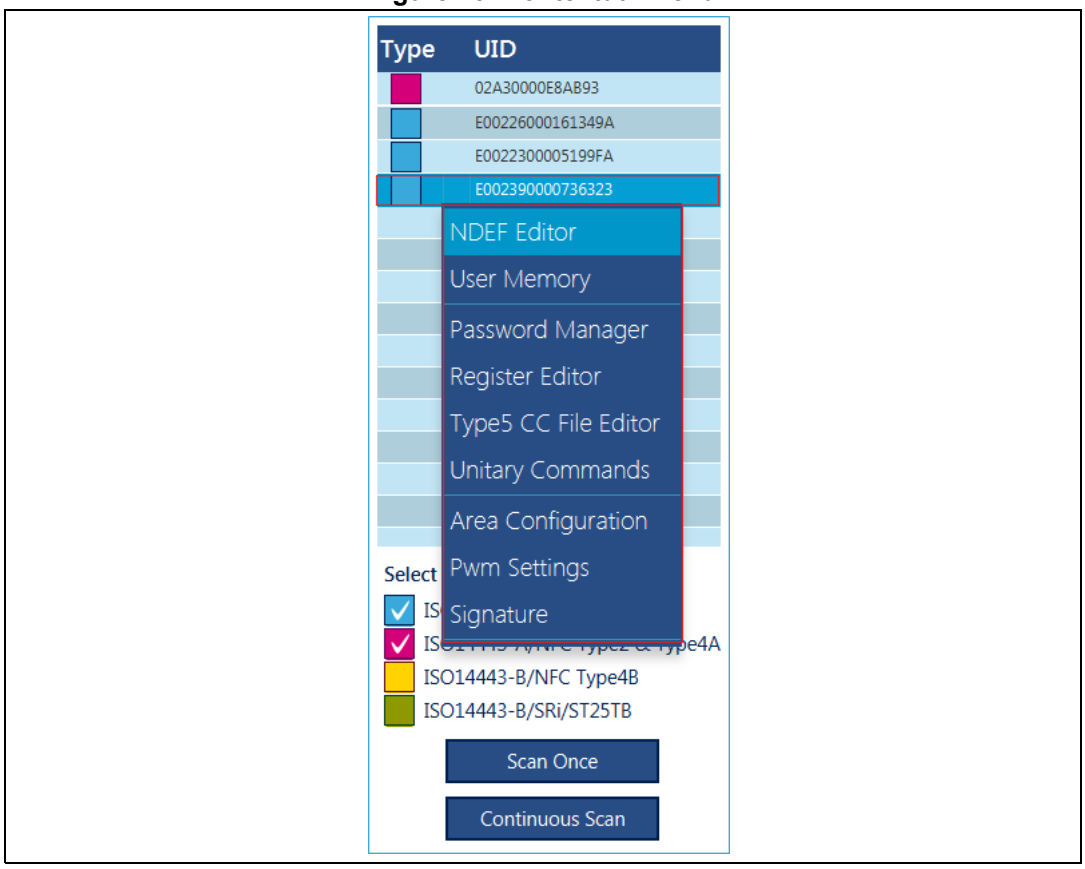


For ISO 15693 and Type 5 tags, user can edit and/or lock the AFI and DSFID values.

4.2.2 Tag contextual menu

This menu is accessed by right-clicking on the targeted row.

Figure 13. Contextual menu



From the contextual menu, it is possible to access all features available for the selected tag.

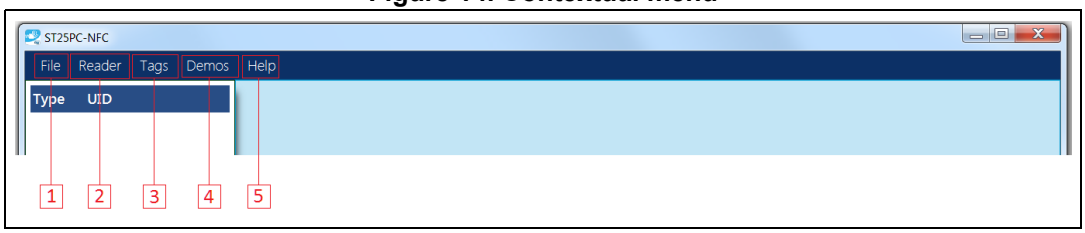
Clicking on a menu item opens the corresponding feature screen for the selected tag only (the feature combo box will be populated with the tag's UID only).

4.3 Main menu

The top *Menu* bar grants access to all RF protocol features and specific features of each product. The same menu items as the *Contextual menu* are available, but in case of the top bar menu, all tags detected during the Inventory stage will be available for selection.

As indicated in *Figure 14*, the launch bar contains five main categories.

Figure 14. Contextual menu



1. Part [1] exits the application (clicking on the red cross at the top right of the main window does the same).
2. Part [2] contains a menu pertaining to the RF reader.
3. Part [3] gives access to all features and tools relative to RF protocols or tags.
4. Part [4] gathers demonstrations related to tag demonstrators.
5. Part [5] is the *Help* menu.

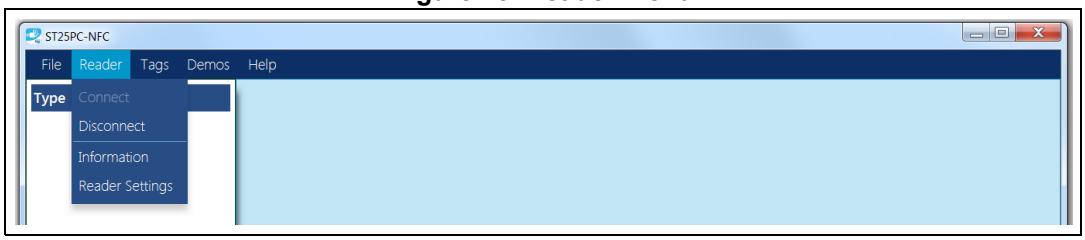
4.3.1 Reader menu

Use the *Reader menu* to connect/disconnect RF readers.

Information menu displays specific data on the RF reader connected to your computer and detected by the application.

Reader Settings menu allows the user to change some settings on specific readers.

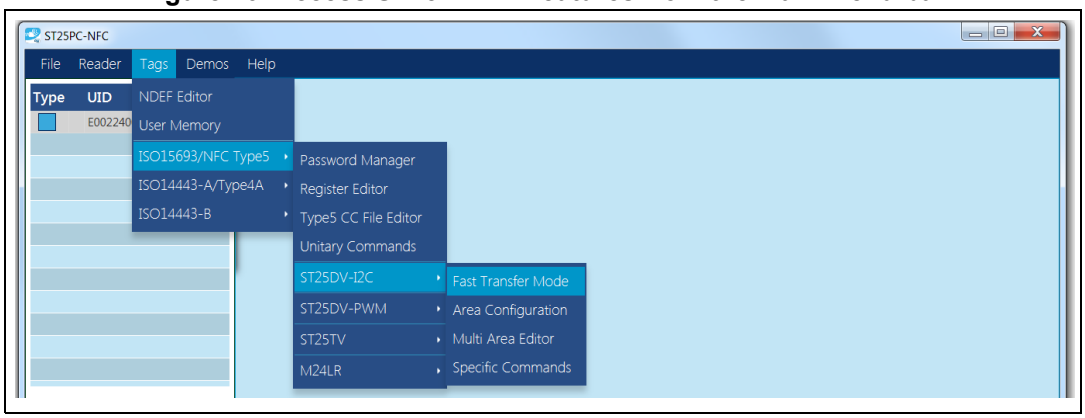
Figure 15. Reader menu



4.3.2 Tags menu

From the *Tags* menu, user can access all features for all supported tags.

Figure 16. Access ST25DV-I2C features from the Main menu bar



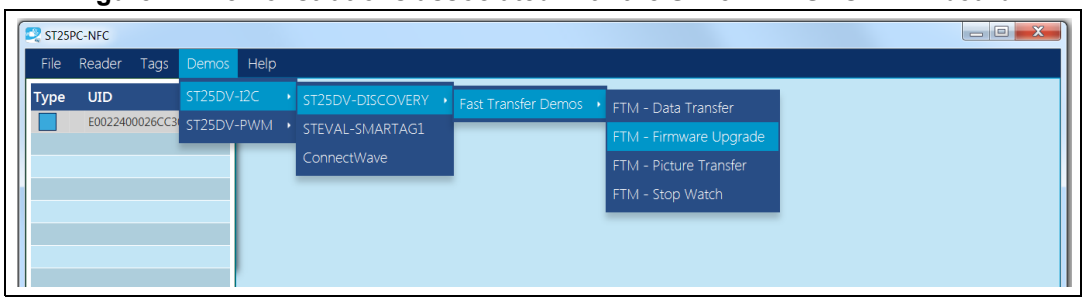
Features for all tags appear on top of the *Tags* menu bar, followed by those for a given protocol (ISO 15693/NFC Type 5 in the example above) and finally sub-menus for each tag family (ST25DV-I2C series).

See *Section 5: Tags menu* for more details.

4.3.3 Demos menu

In the *Demos* menu, you will find software that interacts with ST25 demonstration boards.

Figure 17. Demonstrations associated with the ST25DV-DISCOVERY board

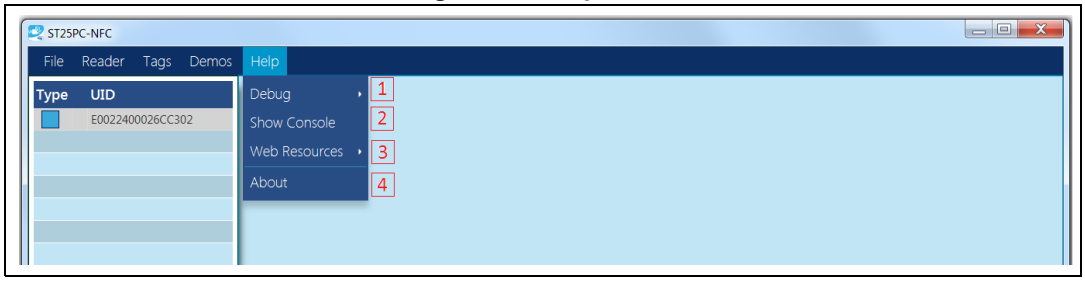


See *Section 6: Demos menu* for more details.

4.3.4 Help menu

The *Help* menu (*Figure 18*) lets the user set debug options (part [1]), display a console to monitor RF communications (part [2]), and provides (part [3]) relevant links to *www.st.com*.

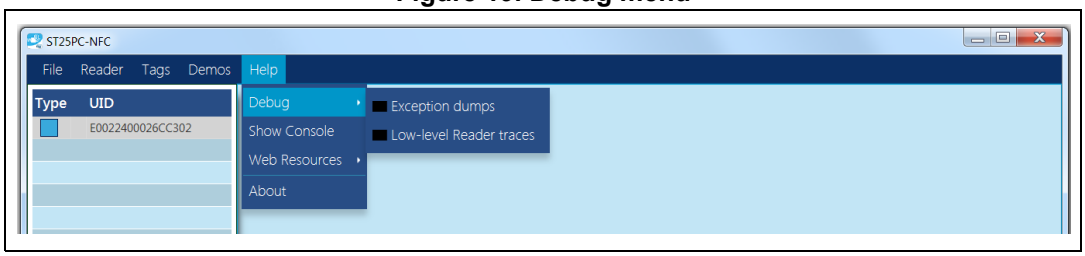
Figure 18. Help menu



Debug menu (*Figure 19*) refers to debug options.

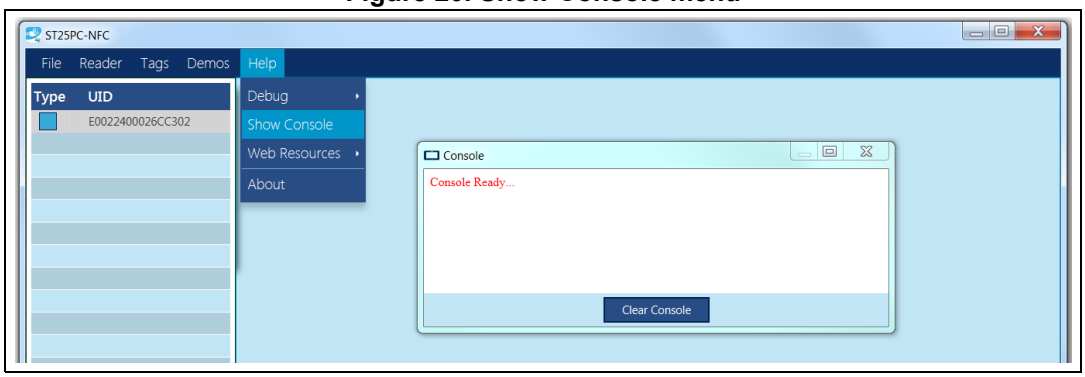
These options will be used to add more information inside the Console log.

Figure 19. Debug menu



Show Console menu (*Figure 20*) displays the console. which shows RF communication frames between the RF reader and the tag, useful to monitor their RF exchanges.

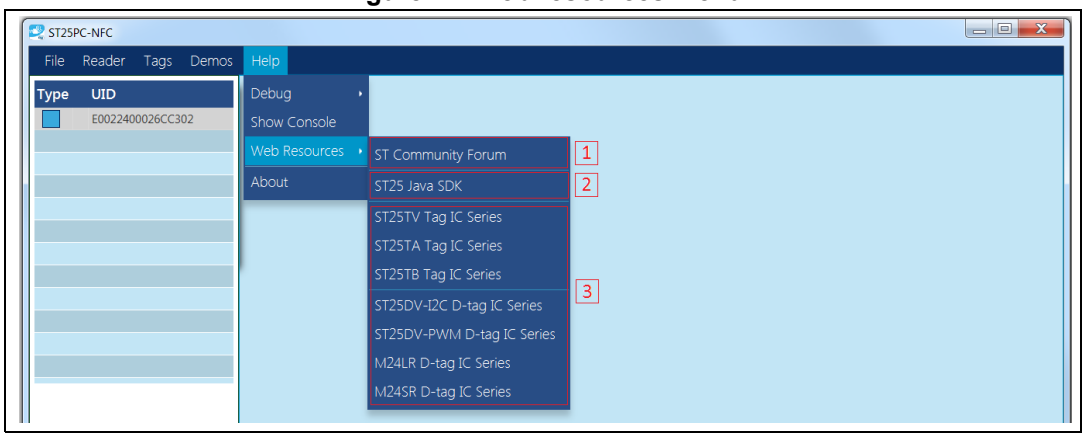
Figure 20. Show Console menu



Web Resources menu (*Figure 21*) contains links to the *www.st.com* website.

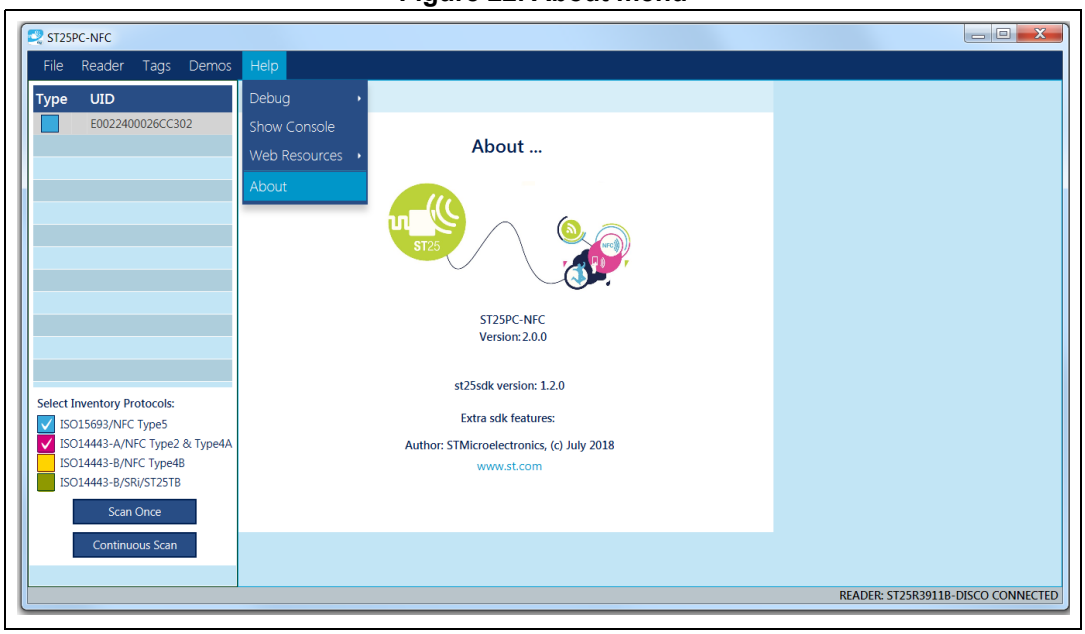
1. Part [1] is the link to ST's Community forum. This web site is used by users to ask questions about STMicroelectronics products and firmwares. You will be able to read questions and answers about this application, or ask new questions.
2. Part [2] is a link to the *st25sdk* library used by the ST25PC-NFC software.
3. Part [3] is a series of links to *www.st.com*. You will be able to quickly access all data about Tags and Dynamic Tags (e.g. datasheet, application notes, resources)

Figure 21. Web resources menu



About menu (part [3] of *Figure 21*) displays ST25PC-NFC revision number and ST25DSK features.

Figure 22. About menu

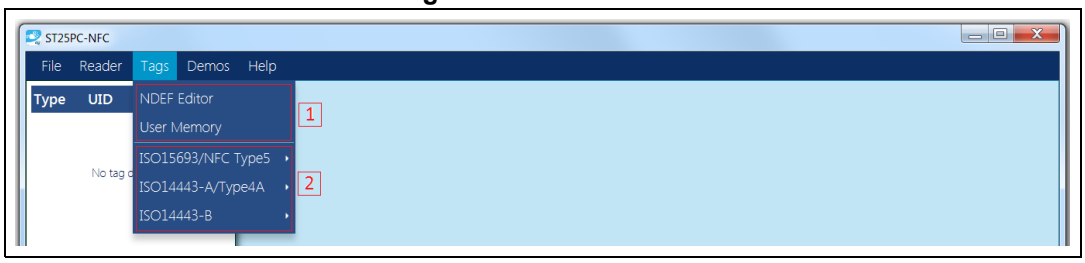


5 Tags menu

The *Tags* menu (see *Figure 23*) can be separated in two parts:

1. Part [1] contains generic tools such as NDEF editor and User Memory management. These tools can be used with any tag, independently of the RF protocol.
2. Part [2], dedicated to RF protocols

Figure 23. About menu



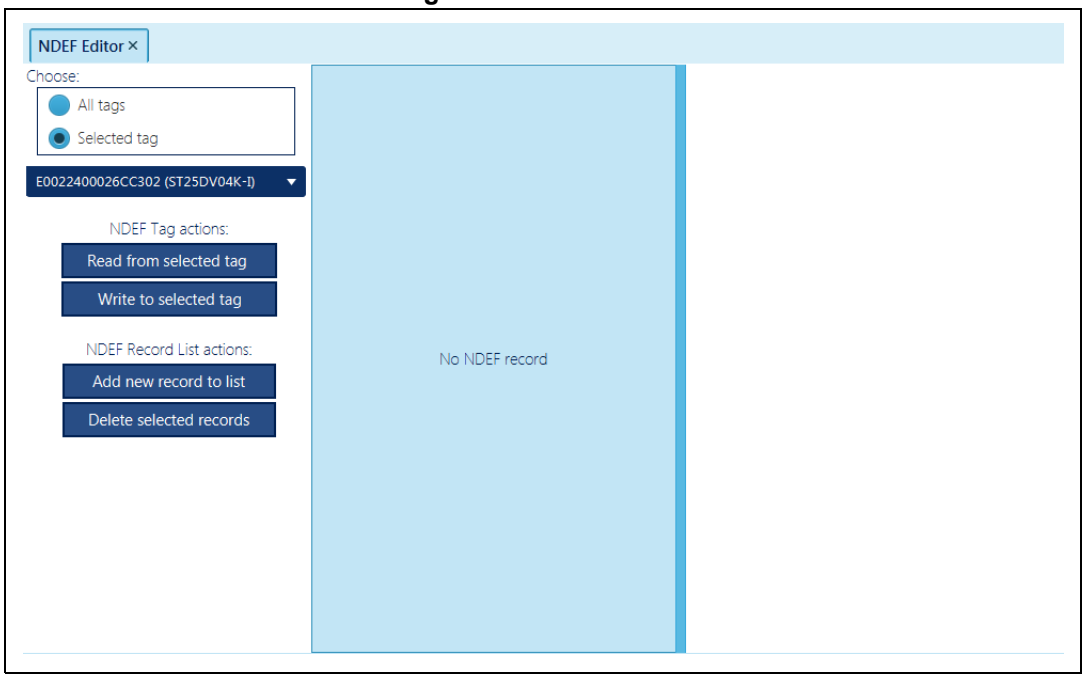
5.1 NDEF editor

The NDEF editor user interface (*Figure 24*) can read NDEF messages from any kind of tag.

If an NDEF message is present on a tag, the NDEF type and its content will be displayed.

NDEF Record List actions buttons allow the user to prepare an NDEF message with one or more NDEF records. When an NDEF message has been prepared, user can write it to selected tags with a click on the *Write to selected tag* button.

Figure 24. NDEF editor



5.2 User Memory

The User Memory interface is useful to read, write or update the content of any tag. Two tabs are available:

- *Tag Operation* tab allows the user to read and write on a tag's EEPROM area (*Figure 25*).
- *File Operation* tab allows the user to store a tag's memory into a file, or write the content of a file to the EEPROM area (*Figure 26*).

Figure 25 represents the read and write user interface of a tag's EEPROM memory.

Figure 25. Tag operation

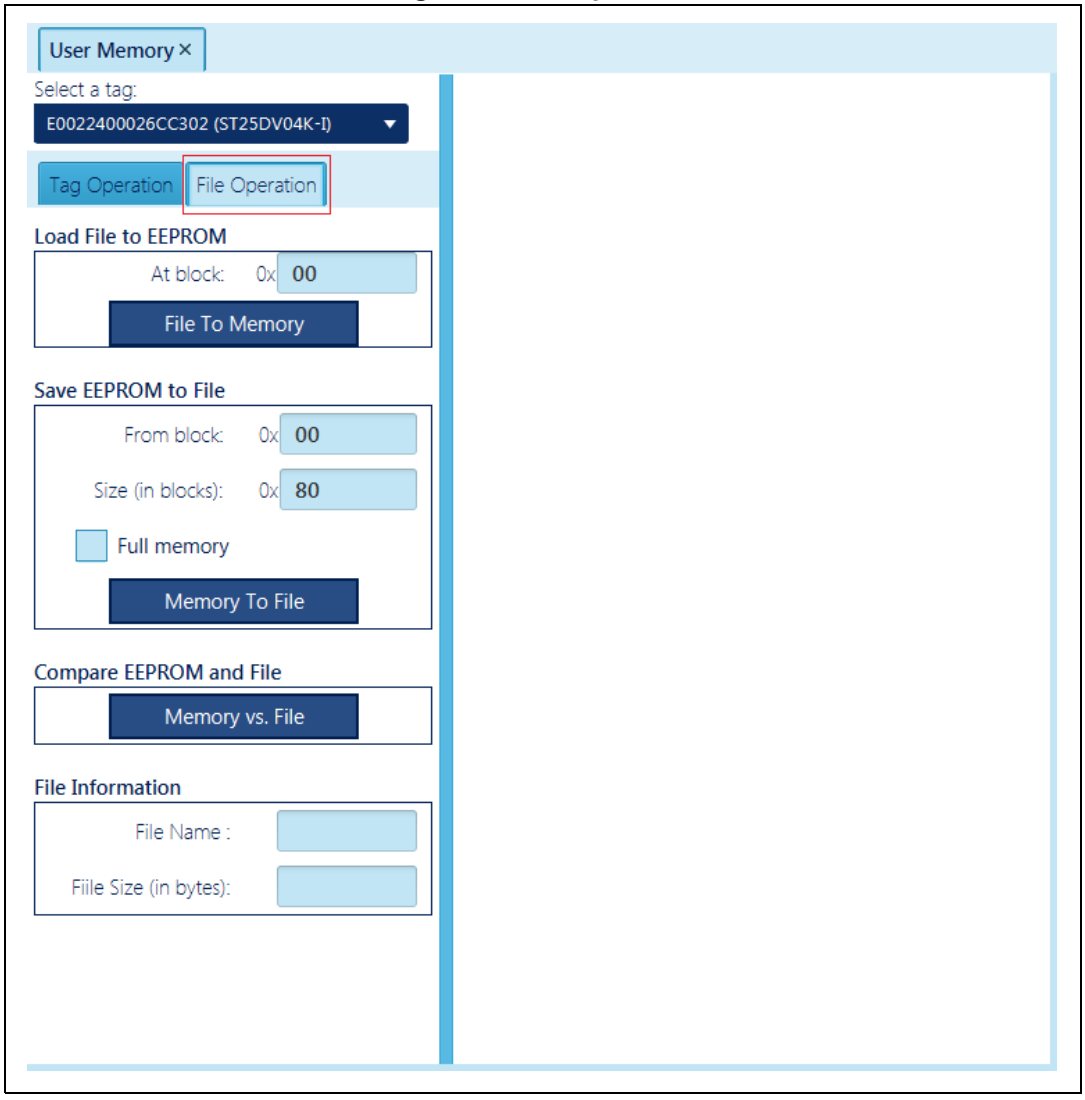
The *Read data* button reads the content of the tag. The *From* field indicates the first address to be read, while *Size* field indicates the number of block or bytes to read.

The *Write* data button writes a block. The *At block* field indicates the address where the data will be written. The *Block Data* field represents the data to be written.

The *Configure Areas* button is a quick access to the Multi-Area features and is only available on ST25DV-I2C series.

Figure 26 shows the *File operation* user interface for tag. This UI allows the user to transfer the content of a file in the tag's memory. The tag's memory can also be stored in a binary file.

Figure 26. File operation



The *File To Memory* button writes the content of a binary file into a tag using write commands.

The *Memory To File* button reads the content of a tag's EEPROM and saves it in a binary file. A window will appear to give the choice of the file directory.

The *Memory vs File* button compares the content of the tag with that of a binary file.

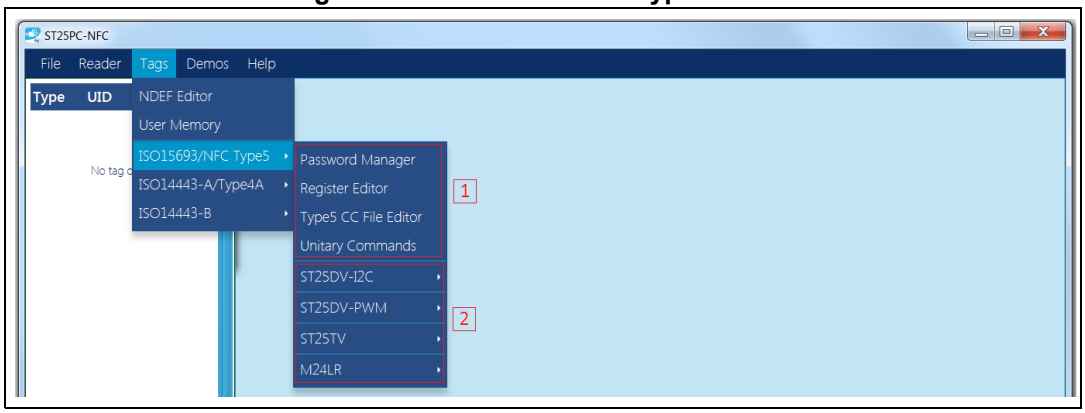
All these actions will be performed on the selected tag.

5.3 ISO 15693 / NFC Type 5

ISO 15963 / NFC Forum Type 5 can be divided in two parts, as shown in *Figure 27*:

- Part [1] describes the user interfaces available for all ISO 15693 products. This UI allows the user to manage features available in most of ISO 15693 products.
- Part [2] lists the STMicroelectronics product series and contains specific features for each of them.

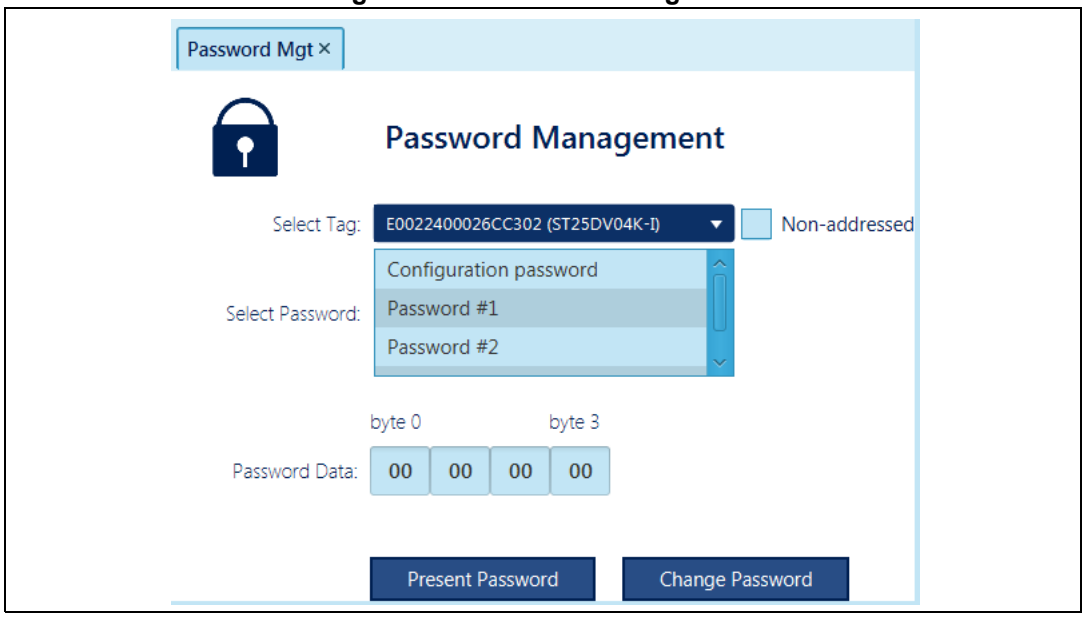
Figure 27. ISO 15693 / NFC Type 5 menu



5.3.1 Generic features

Password Manager menu displays a specific user interface allowing the user to manage passwords. It is a generic tool that can be used on many STMicroelectronics products.

Figure 28. Password management



A *Select Tag* combo box contains all tags identified by the Inventory process.

Depending on the tag, the *Select Password* field will be updated with all supported passwords for the selected product.

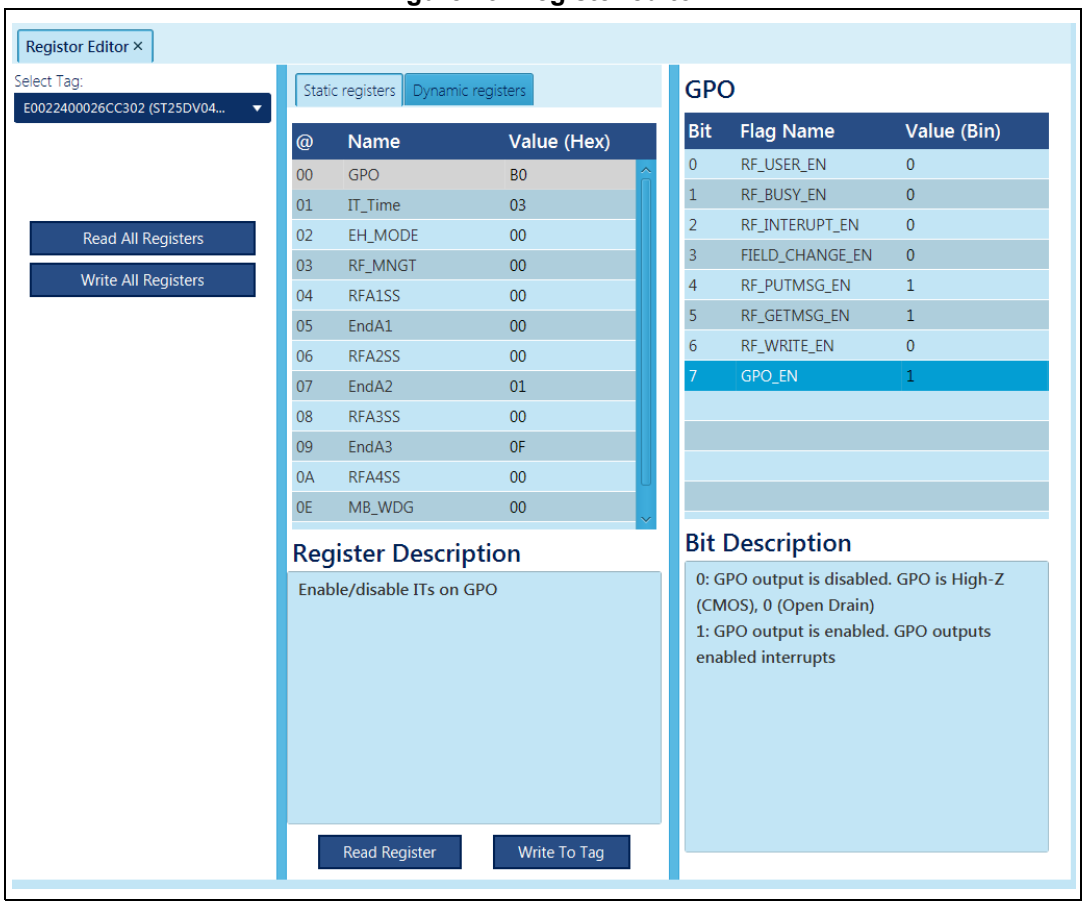
Password data field is used to set the value of the password that will be used.

Present Password button allows the user to present the selected password with *Password Data* field value to the selected tag.

Change Password button makes it possible to change the selected password.

Register Editor menu will be used to manage specific registers of select tag. *Figure 29* is an example of the user interface for the ST25DV-I2C series. This interface is built according to the selected tag (static, dynamic registers).

Figure 29. Register editor



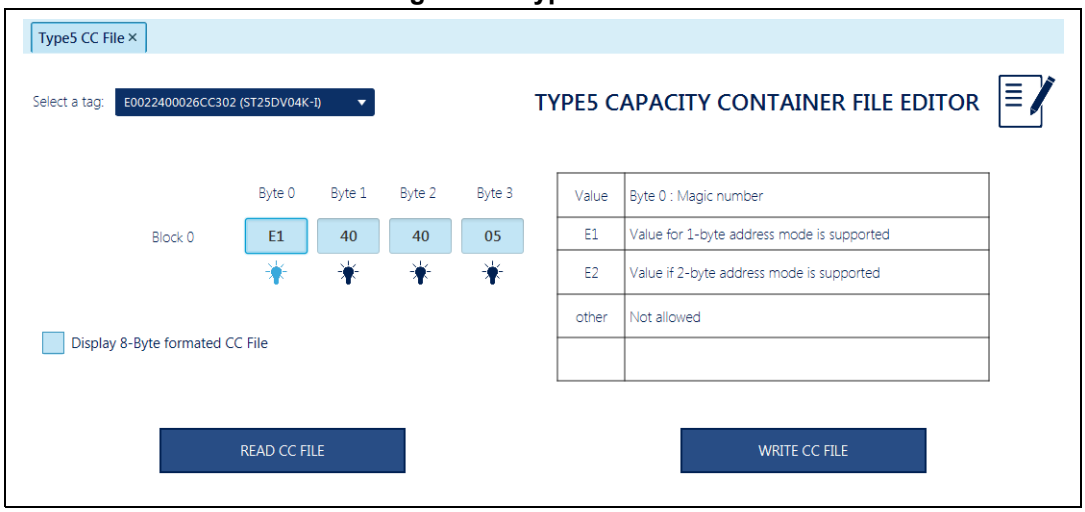
Read All Registers button is available to read all registers at once.

Write All Registers button can be used to write all registers with the Value indicated in the third column. You can change value for any register by double-clicking on any field.

Read Register and *Write To Tag* button lets the user process a single register at a time, click on a specific register to select the one to be read or to be written.

Type 5 CC File Editor menu displays an user interface useful to manage the Capacity Container File of any Type 5 tag (see *Figure 30*). Vicinity tags such as those of the M24LR series are also supported.

Figure 30. Type 5 CC File



READ CC FILE button reads the CC file of the selected tag and displays it on the screen.

Clicking on each byte displays the information and the meaning of the byte, as described in the NFC Forum Type 5 specification.

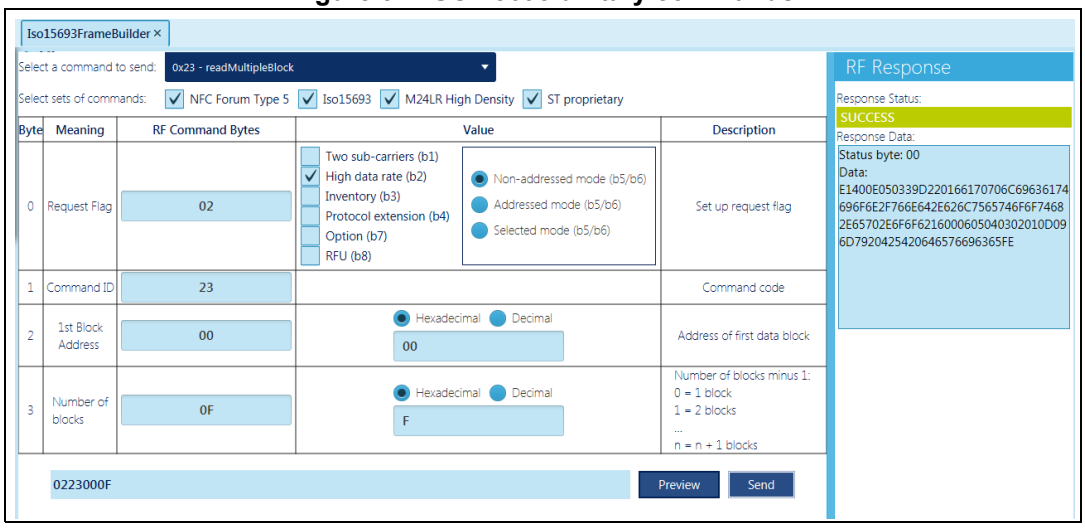
WRITE CC FILE button will write the CC File as displayed on the screen in your selected tag. Extended CC file with an 8-byte formatted CC file is supported.

Unitary Commands menu displays an user interface able to manage all ISO 15693 commands and proprietary commands. This tool is helpful to understand and control the ISO 15693 protocol or to test the behavior of a tag for any command.

Select a command to send combo box contains ISO 15693, Type 5 and STMicroelectronics proprietary commands. The user interface is automatically updated will all the field. The user will be able to fill each field and send the command to the tag present in the reach of the reader's RF antenna.

Figure 31 shows an example of the read multiple block command.

Figure 31. ISO 15693 unitary commands



All necessary fields are displayed following the format of each command. Each field can be modified.

Send button will send the RF frame with all field values.

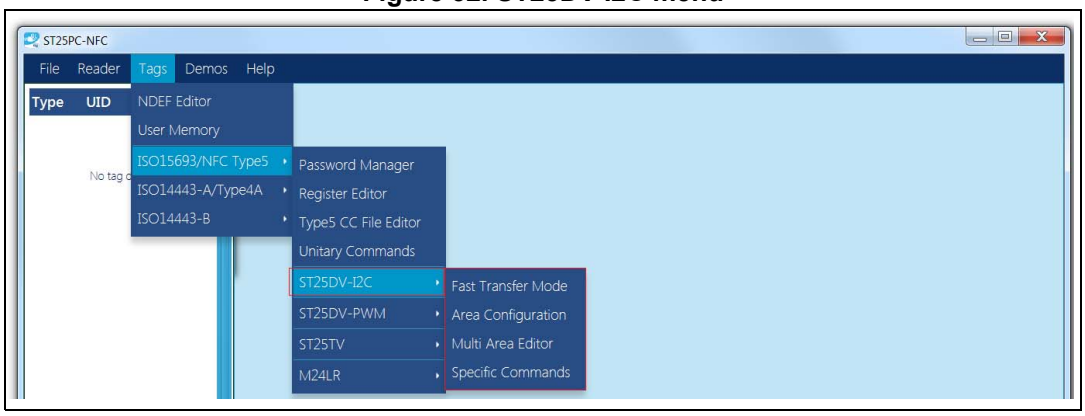
RF Response part of the user interface displays the answer of the tag, if any.

5.3.2 ST25DV-I2C menu

ST25DV-I2C menu displays a sub-menu containing all the specific features of this series.

- Fast transfer mode
- Area configuration
- Multi area editor
- Specific commands

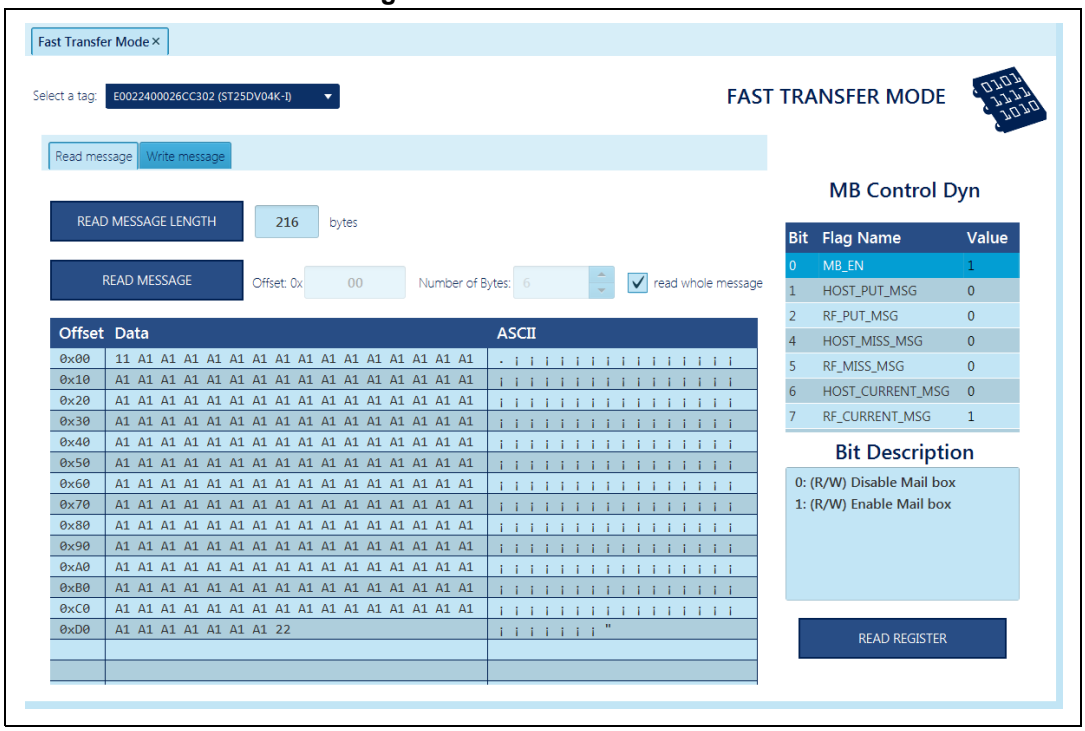
Figure 32. ST25DV-I2C menu



Fast Transfer Mode menu displays an user interface able to manage the mailbox of the Fast Transfer Mode (FTM) features. This is a specific feature of the ST25DV-I2C tags, useful to communicate between an RF reader and an MCU very quickly, without using the EEPROM.

Figure 33 shows the user interface that allows the user to read FTM length and data, and write FTM. It can be used to read FTM Dynamic register values ad check its behavior when using the FTM.

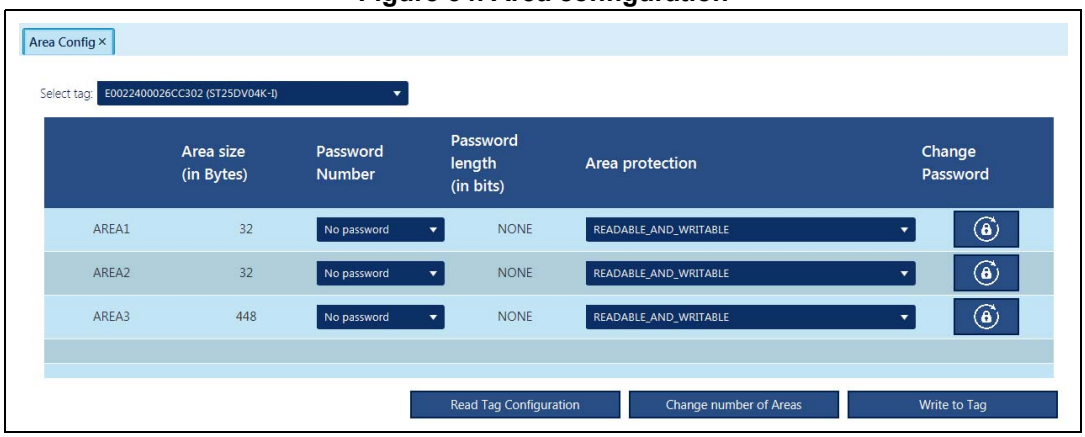
Figure 33. Fast transfer mode



Area Configuration menu displays the user interface that can be used to read and write protection for each area of the selected tag. This user interface is automatically updated depending on the selected tag and its configuration (ST25DV-I2C series can be split in up to four areas, whereas products of the ST25TV series have only one or two areas).

Figure 34 shows an example of ST25DV04K configured with three available areas not protected by any password.

Figure 34. Area configuration

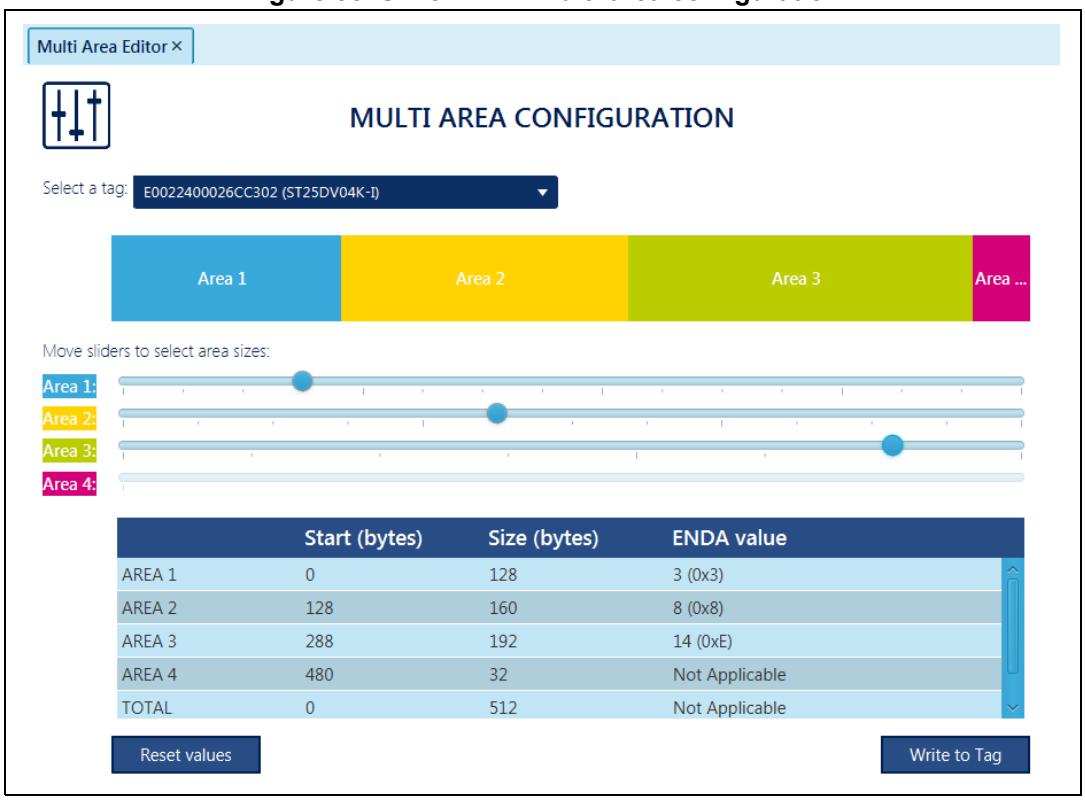


Area protection column will be used to change the protection of areas, when *Password Number* column will be used to select the password number. *Write to Tag* button will apply the modification done in the user interface to the tag.

The *Multi Area Configuration* menu displays an user interface useful to configure the memory partition for your ST25DV tag.

Figure 35 is an example of a ST25DV04K tag configured with four areas. *Start and Size* fields describes the characteristics of each area. ENDA value field is the value of the register defining the areas.

Figure 35. ST25DV-I2C multi-area configuration



Use the scrollbars to change the size of each area or to reduce the number of areas. *Write to Tag* button will modify the registers of your selected tag to match the modifications.

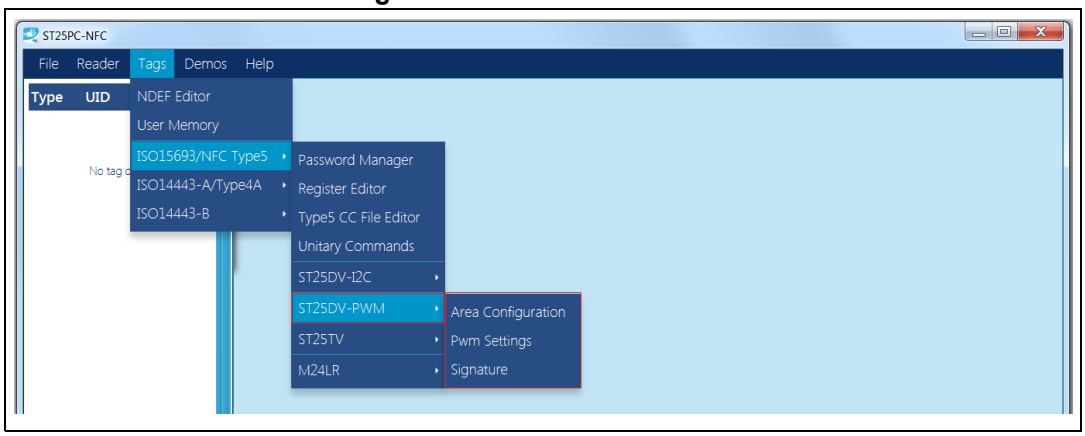
Each area is represented by a color, the same used in the User Memory user interface.

5.3.3 ST25DV-PWM menu

ST25DV-PWM menu displays a sub-menu containing all the specific features of the ST25DV-PWM series.

- *Area Configuration* menu (as described in *Section 5.3.2*). This interface allows the user to configure the ST25DV-PWM with one or two areas.
- *PWM Settings* menu displays an user interface that can be used to manage Pulse Width Modulation configuration.
- *Signature menu* allows the user to read and verify the TruST25™ signature. This feature is only available with a Non-Disclosure Agreement (NDA). Contact your ST Sales office if you have interest in it.

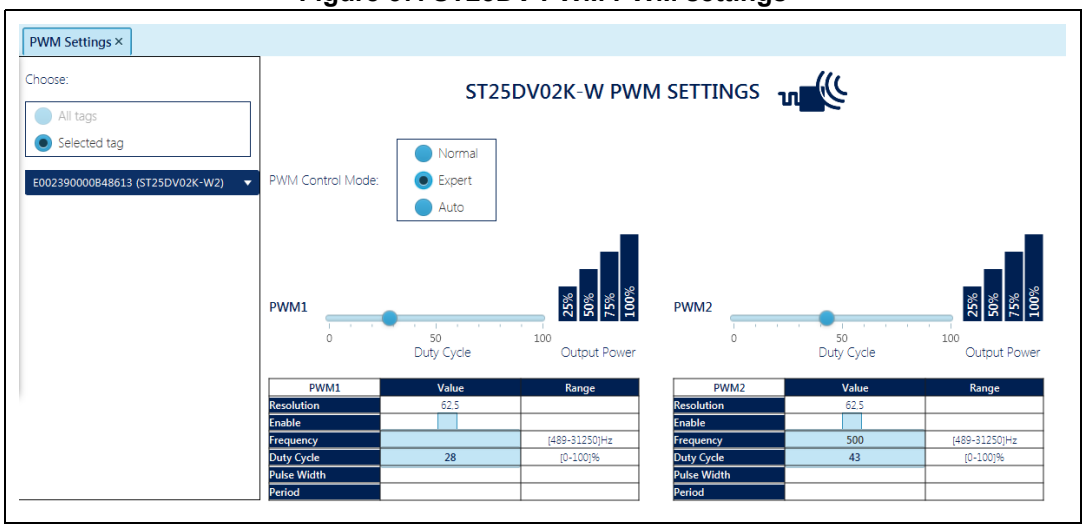
Figure 36. ST25DV-PWM menu



PWM Setting menu will be useful to configure the PWM feature of a selected ST25DV-PWM tag.

Figure 37 shows the PWM features of a ST25DV02K-W2. This product contains two PWMs, while the ST25DV02K-W1 contains only one.

Figure 37. ST25DV-PWM PWM settings



PWM Control Mode selector selects different usages:

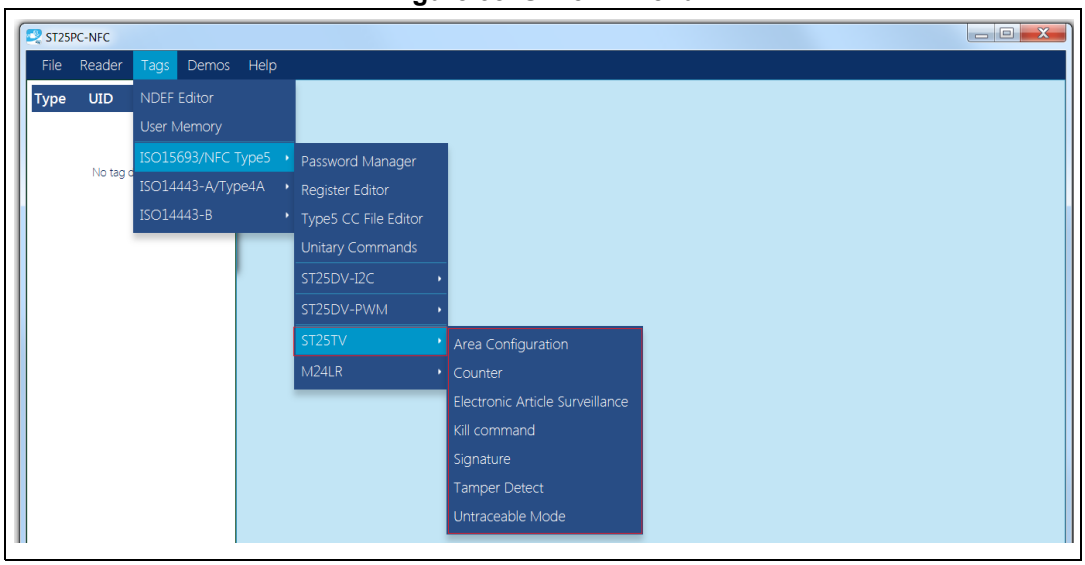
- *Normal* mode allows the user to change PWM setting by moving the slider, changing the duty cycle value. An RF command is automatically send to the ST25DV-PWM tag to apply new settings to the PWM register.
- *Expert* mode allows the user to modify each specific field, changing frequency or duty cycle. The PWM register is automatically updated following changes.
- *Auto* mode changes PWM settings automatically. This mode can be used with the ST25DV-PWM-eSET board.

5.3.4 ST25TV menu

ST25TV menu (*Figure 38*) displays a sub-menu containing all the specific features of the ST25TV series.

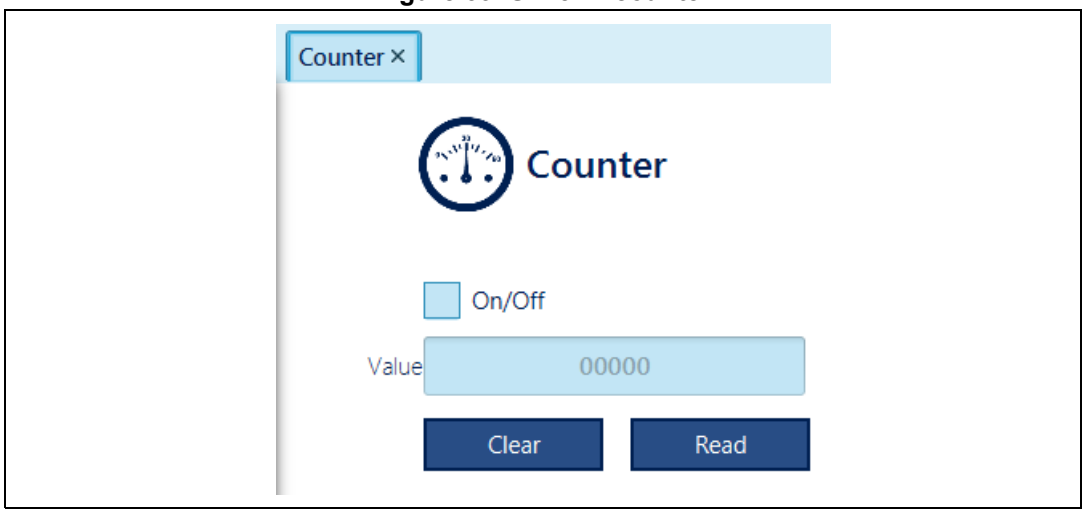
- *Area Configuration* menu (as described in *Section 5.3.2*)
- *Counter* menu
- *Electronic Article Surveillance* menu
- *Kill command* menu
- *Signature* menu allows to read and verify the TruST25™ signature. This feature is only available with a Non-Disclosure Agreement (NDA). Contact your ST Sales office if you have interest in this feature.
- *Tamper Detect* menu
- *Untraceable Mode* menu

Figure 38. ST25TV menu



Counter menu display user interface can be used to manage the counter of a ST25TV tag.

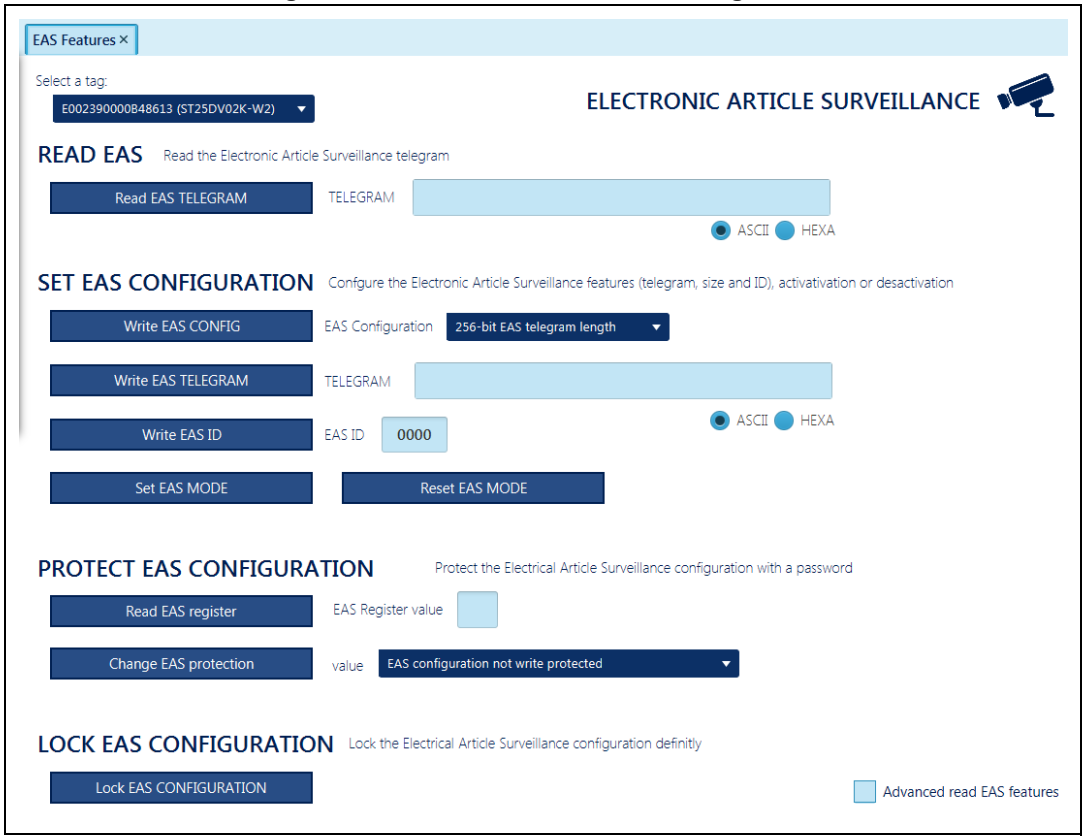
Figure 39. ST25TV counter



Read button will be used to read the value of the counter. Using *Clear* button, the user will be able to clear the counter value. As defined by the datasheet, a password will be required. The *Password Management* user interface will appear to request the correct password.

Electronic Article Surveillance menu displays the user interface as shown in *Figure 40*. This UI allows the user to read the EAS telegram, to configure it, and to set specific protections.

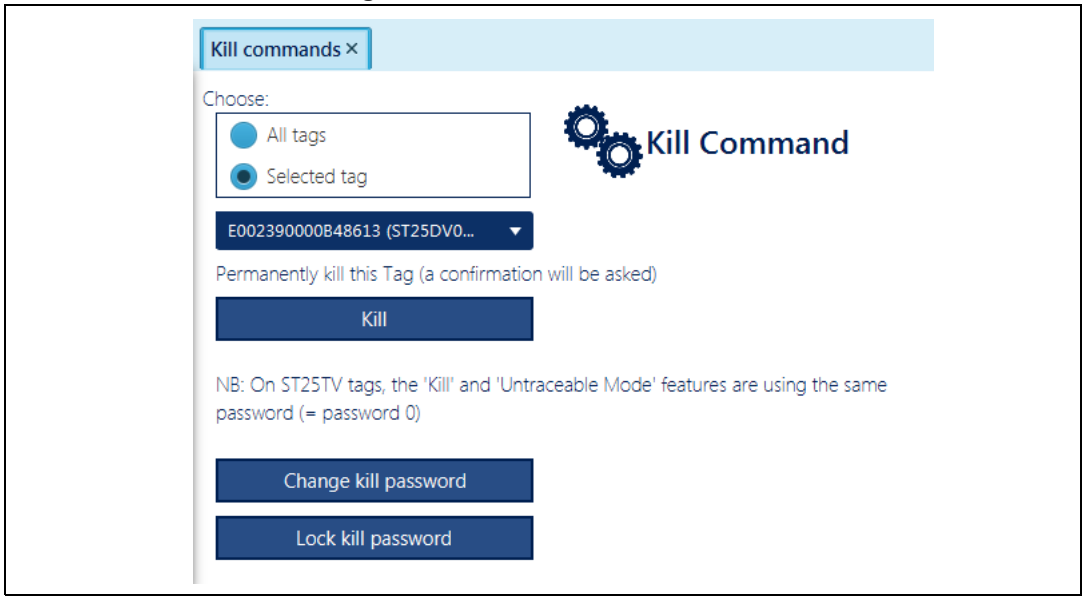
Figure 40. ST25TV electrical article signature



Advance read EAS features selector displays additional commands according to ST25TV series datasheet.

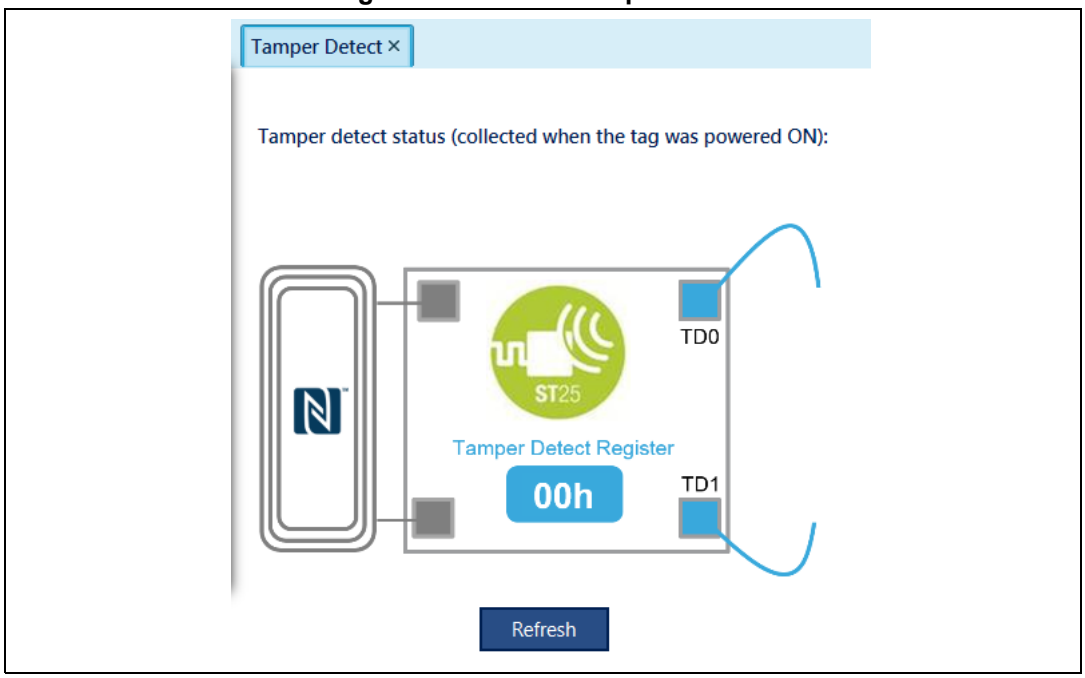
Kill commands menu displays an user interface to manage Kill feature. This user interface has to be used with care, as it is a non-reversible feature.

Figure 41. ST25TV Kill command



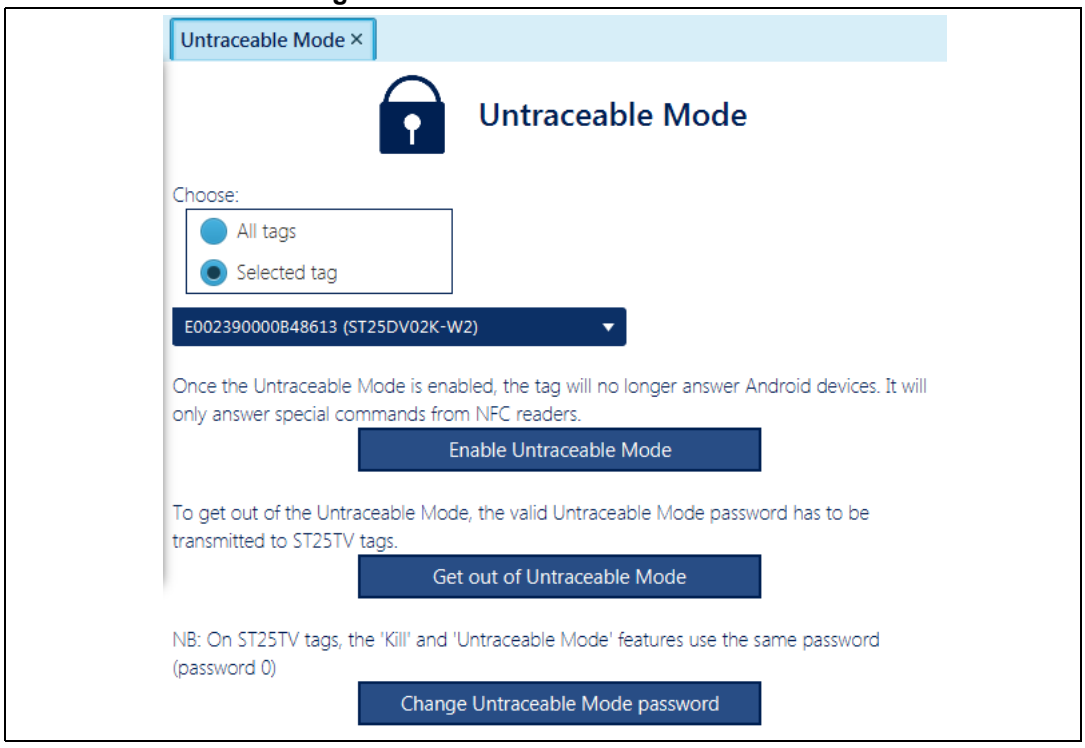
Tamper Detect menu demonstrates the behavior of the tamper detect feature. If an ST25TV tag is present on the RF antenna of the reader, as soon as a Tamper detect screen is opened, some commands are sent to the ST25TV tag to read the status of the detector. Depending on this status, the TDO/TD1 wire is shown as open or shorted. *Figure 42* shows an example of ST25TV tag with the Tamper detect opened. Click on *Refresh* button to read again the Tamper Detect register and display its new status.

Figure 42. ST25TV Tamper detect



Untraceable Mode menu displays an user interface to manage Untraceable Mode feature. *Figure 43* shows this user interface.

Figure 43. ST25TV Untraceable mode

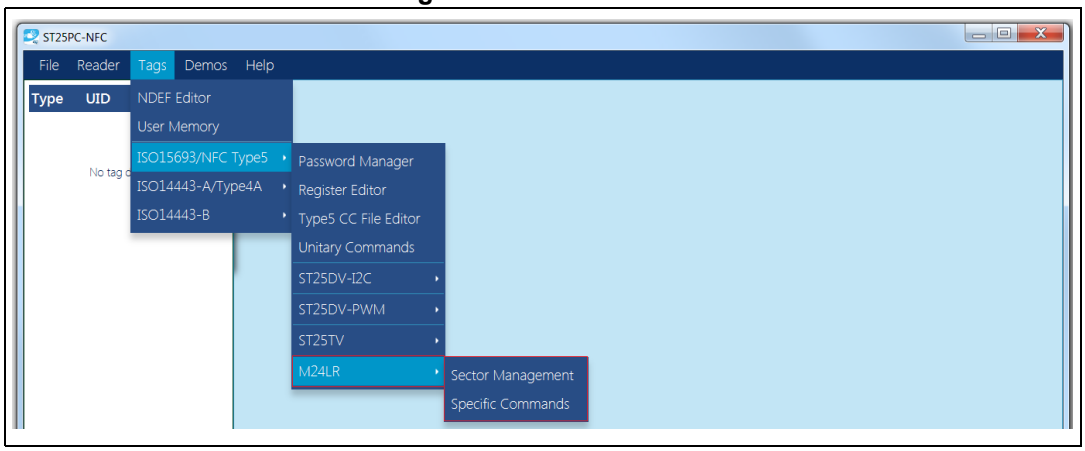


Enable Untraceable Mode, *Get out of Untraceable Mode* and *Change Untraceable Mode password* buttons will be used to manage this specific feature.

5.3.5 M24LR menu

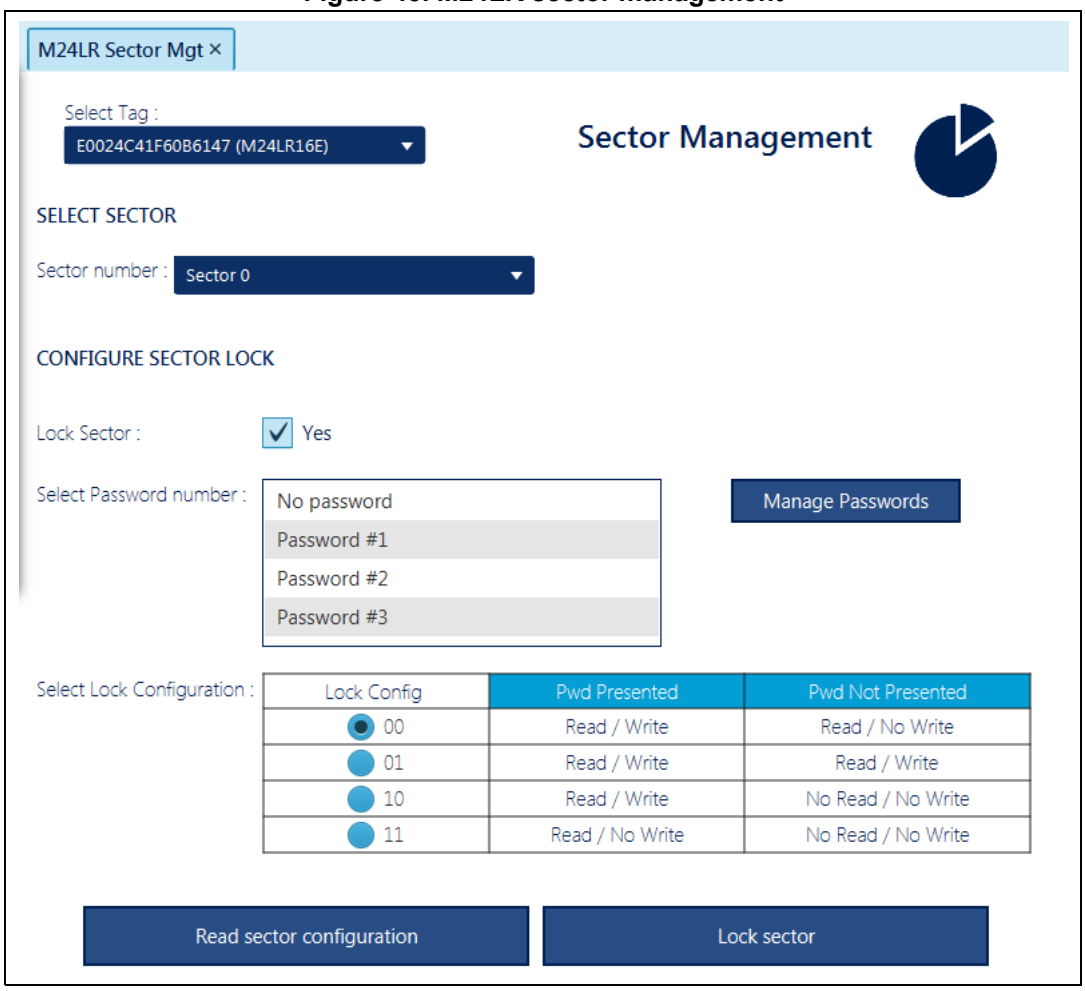
M24LR menu (*Figure 44*) allows the user to play with specific commands of the M24LR series or to manage Sector passwords.

Figure 44. M24LR menu



Sector Management menu (*Figure 45*) displays an user interface useful to manage the sectors of any M24LR tag.

Figure 45. M24LR sector management



Read sector configuration button reads the configuration of the selected tag. As soon as the configuration is read, the user can select a Sector number and the configuration of the selected sector is displayed on the screen:

- Lock sector status
- Password number that lock this sector
- Lock configuration value

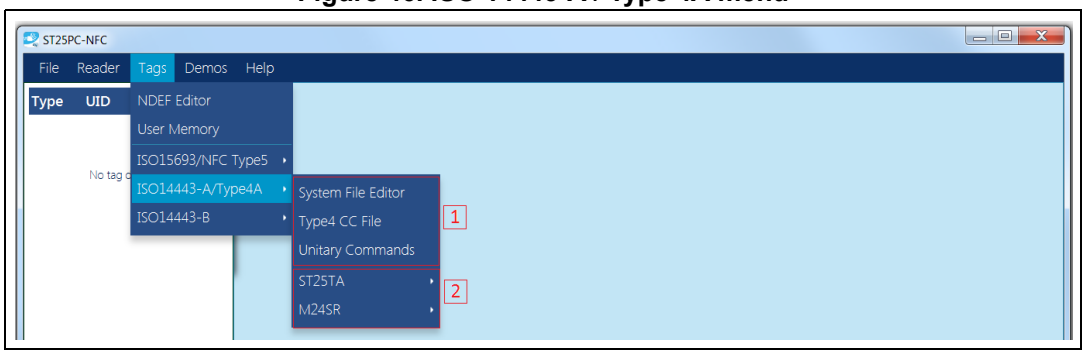
Lock sector button can be used to lock any sector with a specific configuration. Select the sector number, choose the password number (if needed) and select the lock configuration. *Lock sector* button will apply the selected configuration to the selected tag.

5.4 ISO 14443-A / Type 4A menu

ISO 14443-A / Type 4A menu can be divided in two parts, as shown in *Figure 46*:

1. Part [1] describes the user interfaces available for all Type 4A products.
2. Part [2] lists the STMicroelectronics product series and contains specific features for each of them.

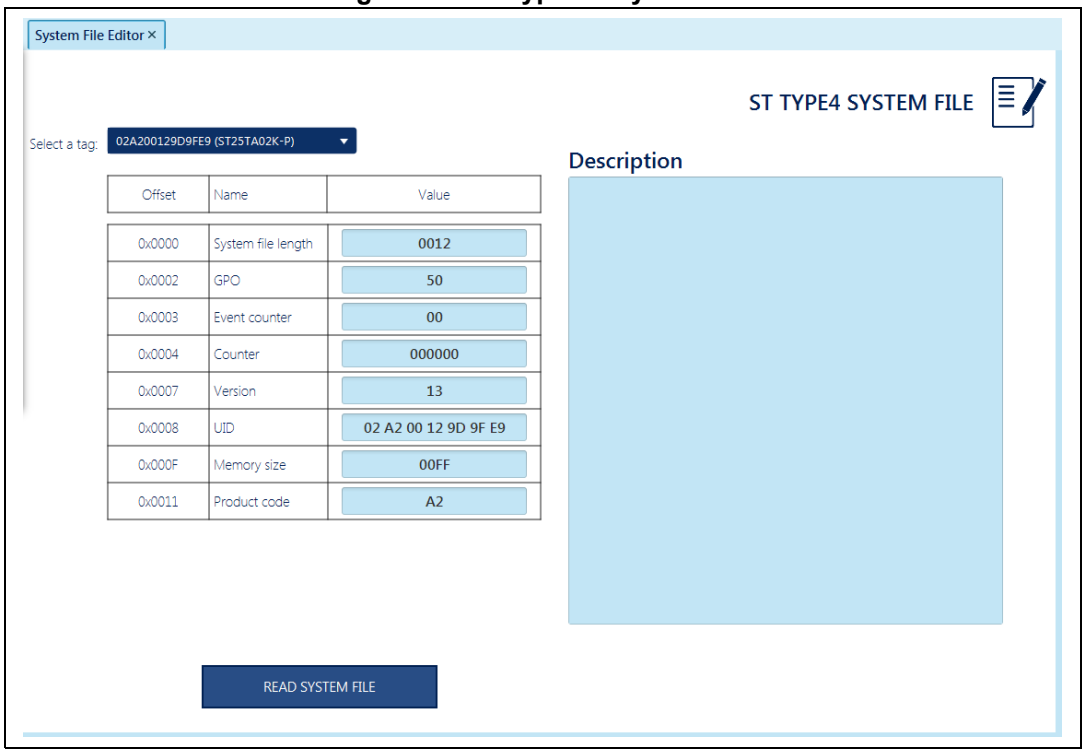
Figure 46. ISO 14443-A / Type 4A menu



5.4.1 Generic features

System File Editor menu displays an user interface useful to manage the system file of Type 4A STMicroelectronics tags (see *Figure 47*).

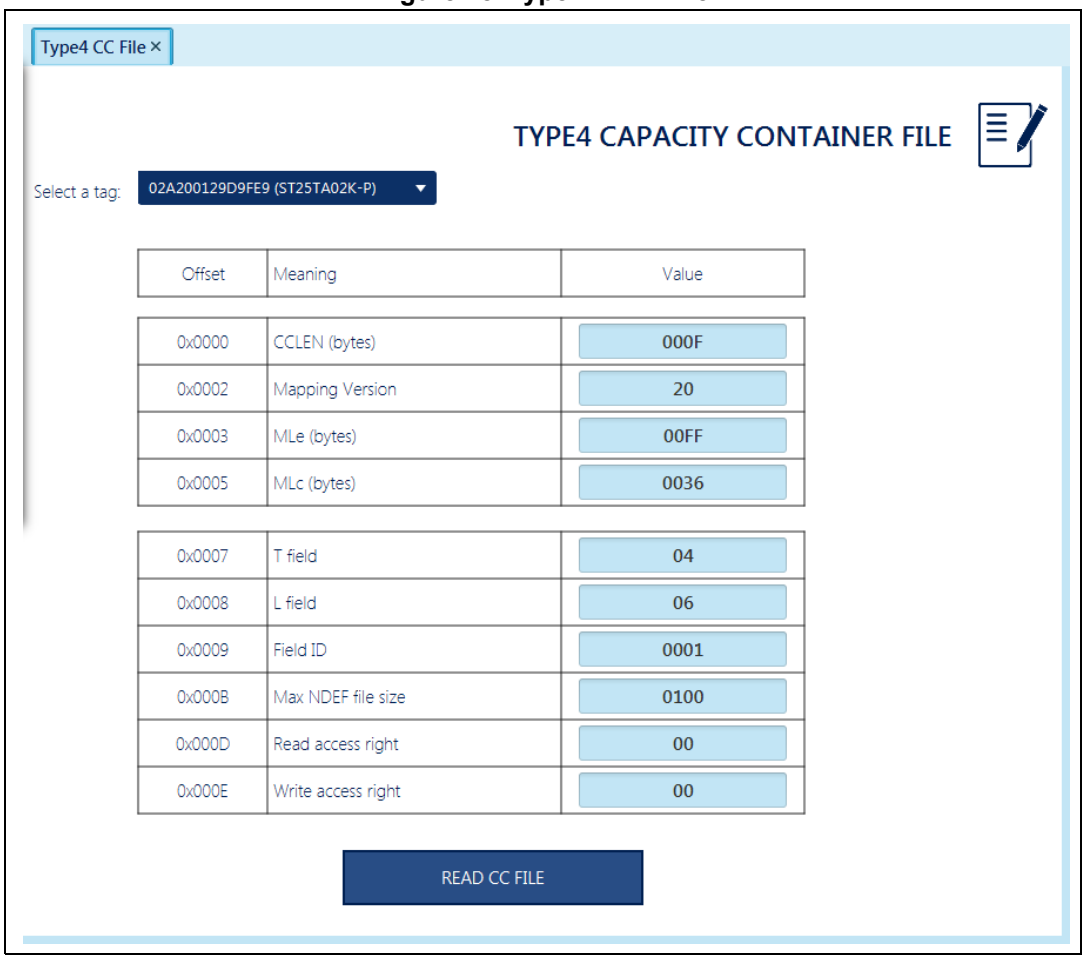
Figure 47. ST Type 4A system file



READ SYSTEM FILE button displays the content of the system file of the selected tag. Clicking on any field displays the description of this field.

Type 4A CC File Editor menu displays an user interface useful to manage the Capacity Container File of any Type 4A tag (see *Figure 48*).

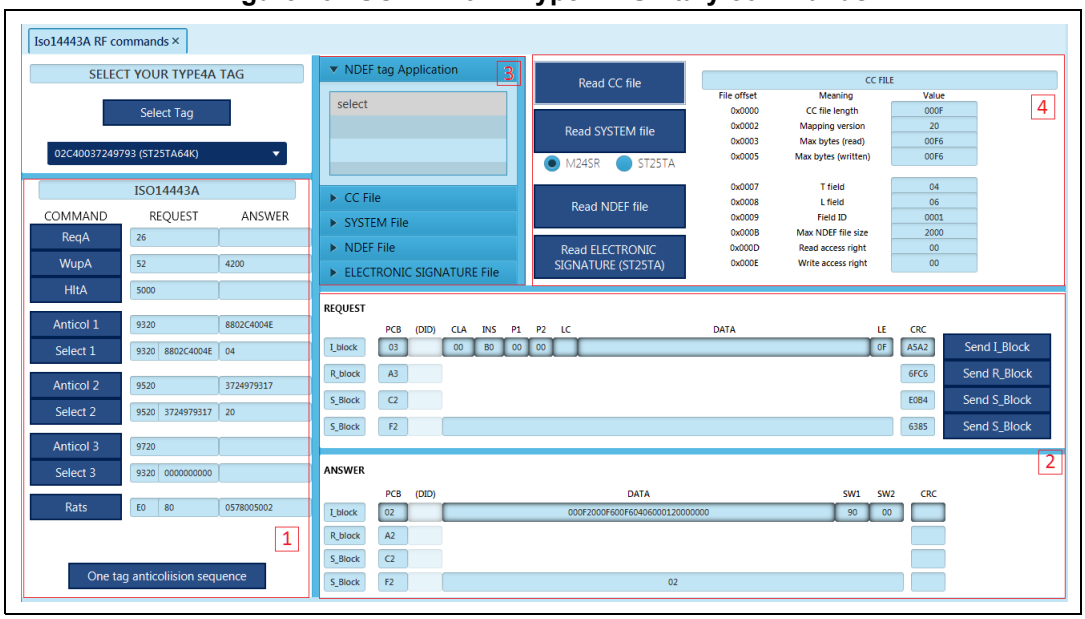
Figure 48. Type 4A CC File



READ CC FILE button reads the CC file of the selected tag and displays it on the screen. Putting the mouse over any field displays a tooltip with the description of the field.

Unitary Commands menu (*Figure 49*) displays an user interface able to manage all ISO 14443-A commands and Type 4A APDU commands. This tool is helpful to understand and control the ISO 14443-A anticollision process and to manage Type 4A APDU frame format.

Figure 49. ISO 14443-A/ Type 4A Unitary commands



Part [1] concerns the ISO 14443-A commands. Each command can be send clicking on any button. Some field such as Select 123, REQUEST fields can be modified with expected data to ensure anti-collision process. Answer column will contain the tag answer, if any.

One tag anti-collision sequence button will chain all ISO 14443-A commands to follow anti-collision process and to be able to select a tag (be sure that only one tag is on the RF reader).

Parts [2], [3] and [4] concern Type 4A commands. Note that a tag has to be selected with ISO 14443-A anti-collision process to be able to answer to Type 4A requests.

Part [2] contains Type 4 APDU frames for request and answer.

- *REQUEST* part contains the request to be sent to the tag. *Send I_Block* button allows the user to send the APDU frame to the tag.
- *ANSWER* part is filled in case of tag answer.

Part [3] is a menu containing all Type 4A requests. Selecting any of this request by clicking on it will fill the part[2] *REQUEST APDU* command. Click on *Send I_Block* button to send it.

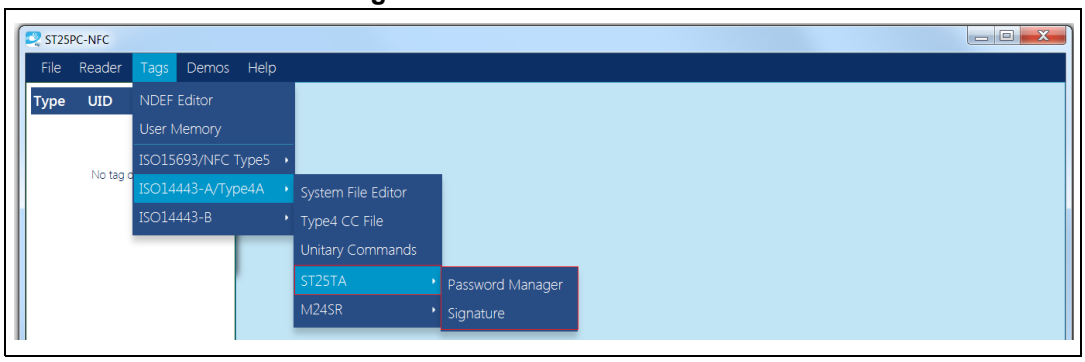
Part [4] contains some buttons to launch the complete read process (*Select file*, *Read file*). Clicking on *Read CC file*, *Read SYSTEM file*, *Read NDEF file* and *Read ELECTRONIC SIGNATURE* buttons displays the data in Part [4] of the user interface.

5.4.2 ST25TA menu

ST25TA menu displays a sub-menu containing all the specific features of the ST25TA series.

- *Password Management* menu (as described in *Section 5.3.1: Generic features*)
- *Signature* menu allows reading and verifying the TruST25™ signature. This feature is only available with a Non-Disclosure Agreement (NDA). Contact your ST Sales office if you have interest in it.

Figure 50. ST25TA series menu

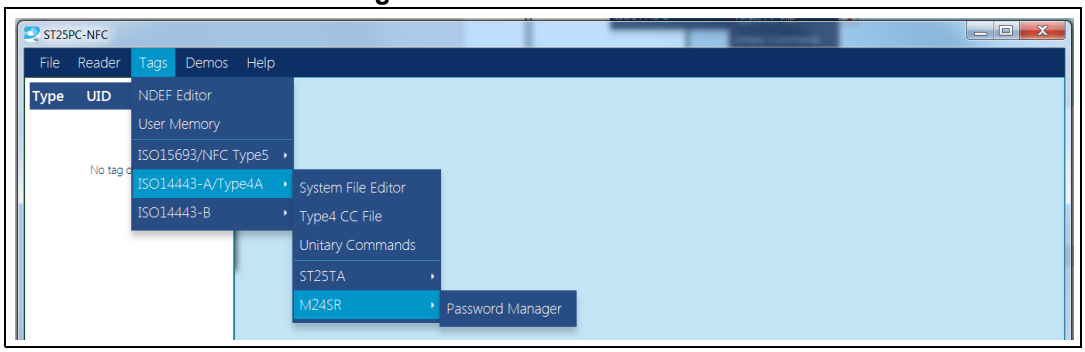


5.4.3 M24SR menu

M24SR menu displays a sub-menu containing all the specific features of the M24SR series.

- Password Management menu (as described in *Section 5.3.1: Generic features*)

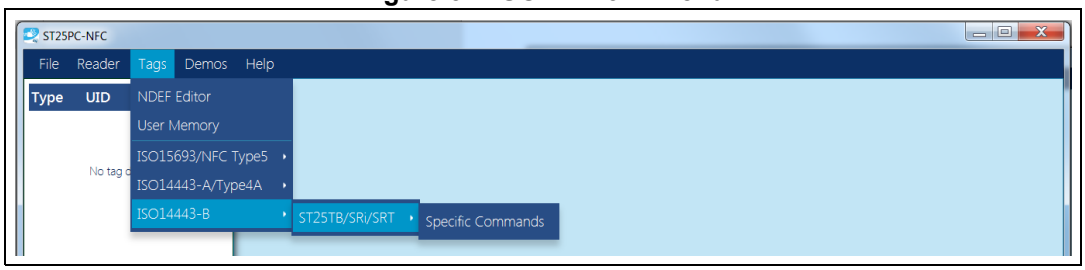
Figure 51. M24SR series menu



5.5 ISO 14443-B menu

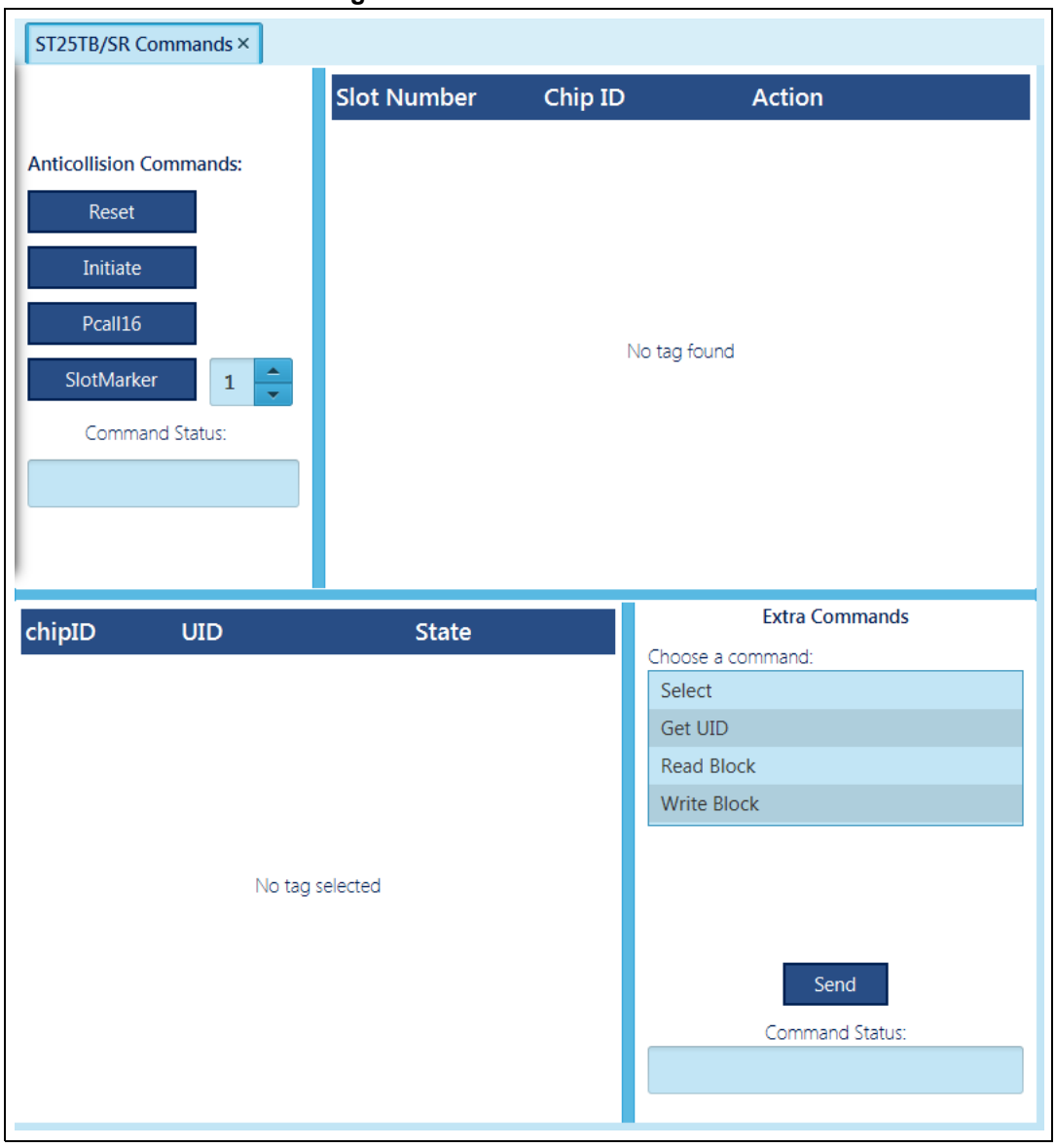
ISO 14443-B menu (*Figure 52*) displays a sub-menu containing the specific features of the STMicroelectronics SRi, SRT and ST25TB series.

Figure 52. ISO 14443-B menu



Specific Commands menu displays an user interface able to manage ISO 14443-B. This tool is helpful to understand and control the ISO 14443-B STMicroelectroncs products. *Figure 53* shows the user interface.

Figure 53. ST25TB user interface



6 Demos menu

Demos menu displays a sub-menu containing the name of generic products. Some user interfaces have been developed to play with this demonstration boards and are available in each sub-menu.

- *ST25DV-I2C* menu
- *ST25DV-PWM* menu

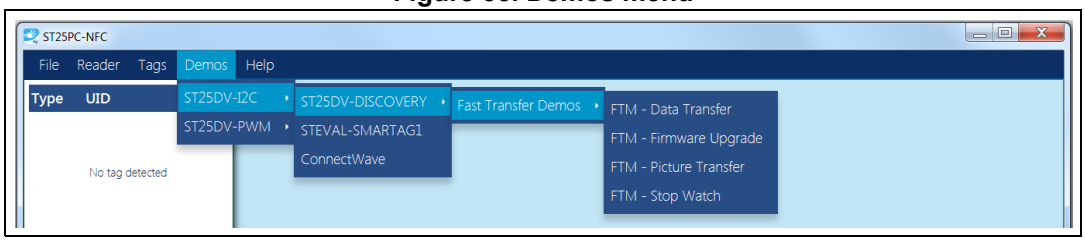
Figure 54. Demos menu

6.1 ST25DV-I2C menu

ST25DV-I2C menu displays a sub-menu containing the name of some demonstration boards. Some user interfaces have been developed to play with these boards and are available in each sub-menu.

- *ST25DV-DISCOVERY* menu
- *STEVAL-SMARTAG1* menu
- *ConnectWave* menu

Figure 55. Demos menu



6.1.1 ST25DV-DISCOVERY menu

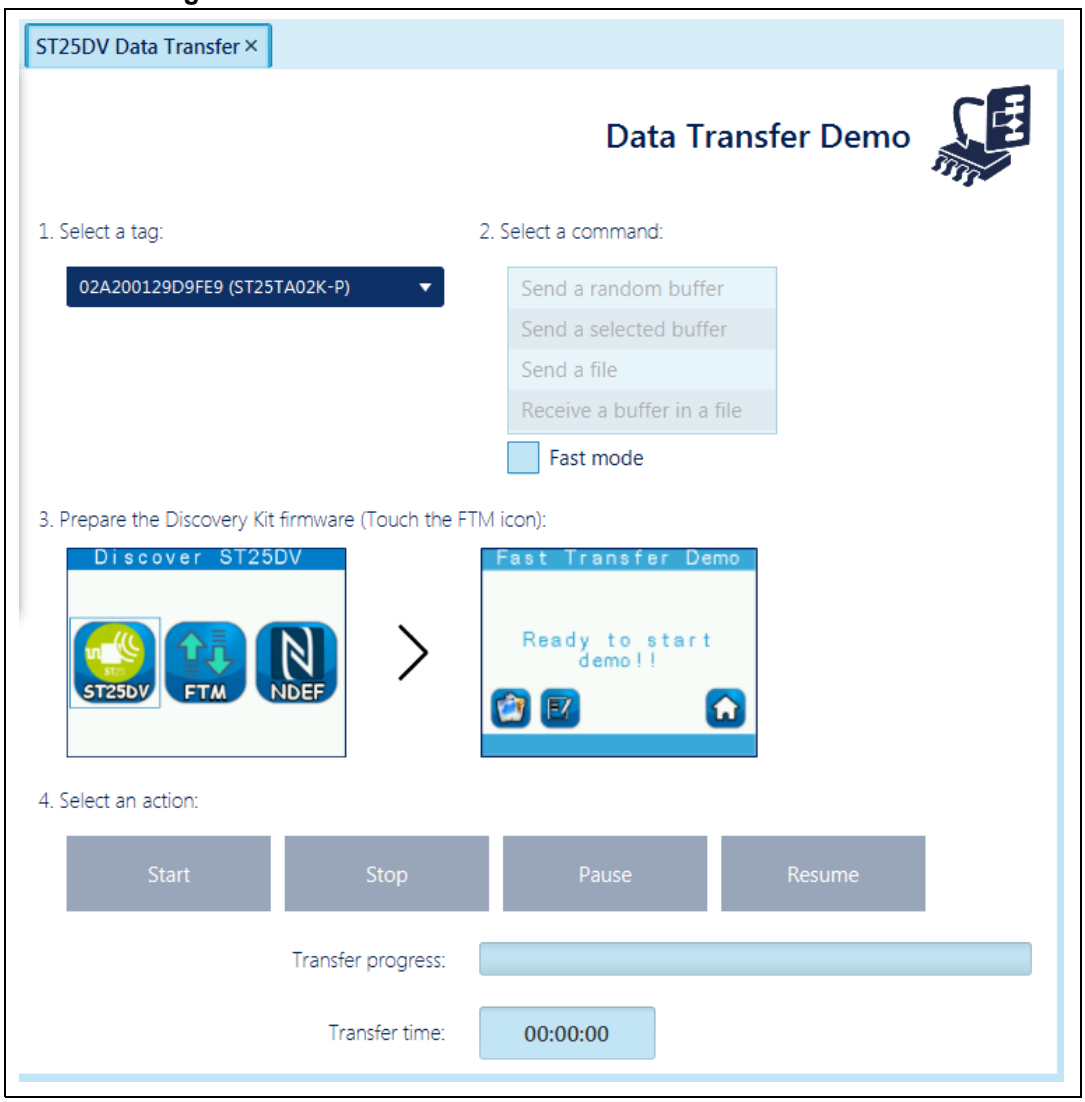
ST25DV-DISCOVERY menu displays a sub-menu named *Fast Transfer Demos (FTM)* containing some demonstrations to be played with the ST25DV-DISCOVERY board:

- *FTM - Data transfer* menu
- *FTM - Firmware Upgrade* menu
- *FTM - Picture Transfer* menu
- *FTM - Stop Watch* menu

Figure 56. ST25DV-DISCOVERY demonstrations menu

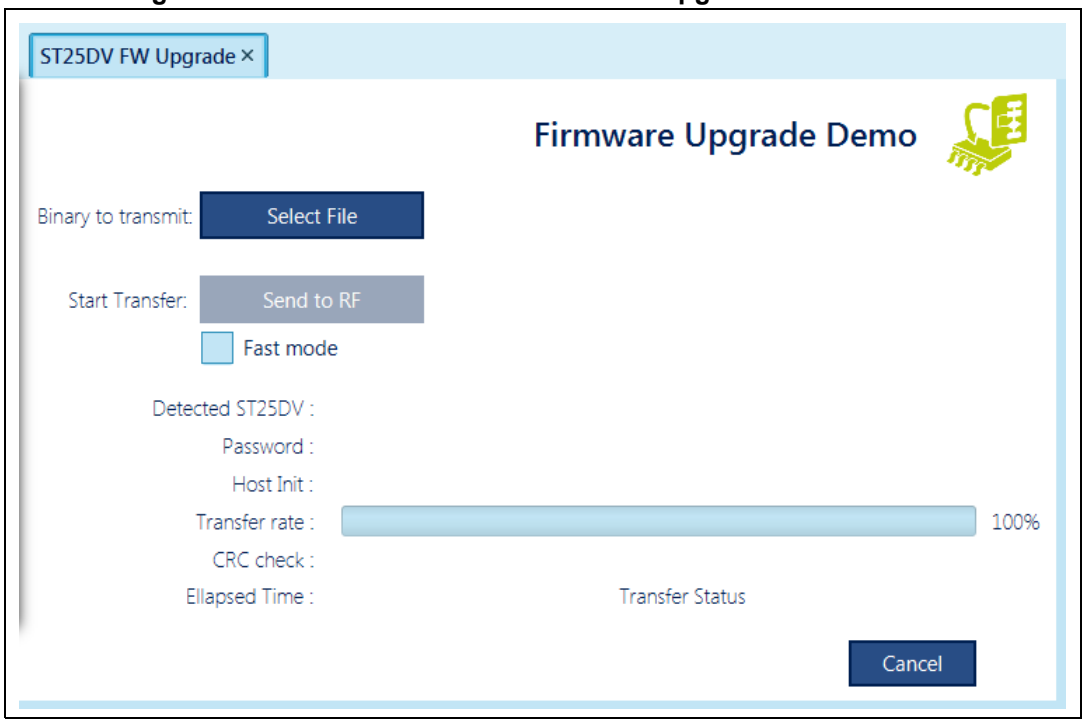
FTM - Data Transfer menu displays an user interface to demonstrate the transfer of binary data from the RF reader to the ST25DV-DISCOVERY using the ST25DV-I2C Fast Transfer Mode mailbox.

Figure 57. ST25DV-DISCOVERY Data Transfer demonstration



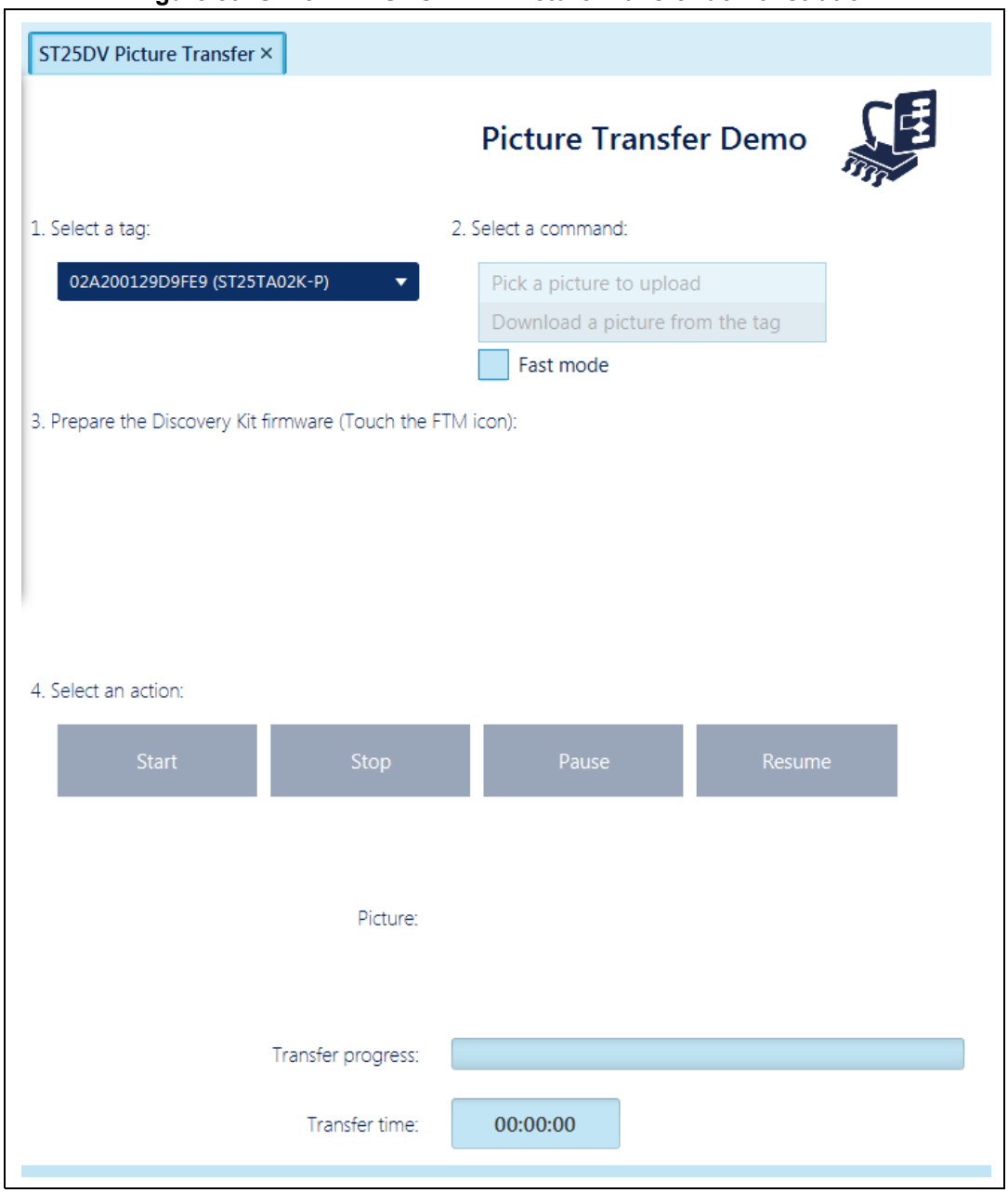
FTM - Firmware Upgrade menu displays an user interface to demonstrate the transfer of new firmware from the RF reader to the STM32 microcontroller on the ST25DV-DISCOVERY board using the ST25DV-I2C's Fast Transfer Mode mailbox.

Figure 58. ST25DV-DISCOVERY Firmware Upgrade demonstration



FTM - Picture Transfer menu displays an user interface to demonstrate the transfer of a picture from the RF reader to the STM32 of the ST25DV-DISCOVERY using the ST25DV-I2C's Fast Transfer Mode mailbox. The user interface allows the user to upload a picture from the ST25DV-DISCOVERY to the RF reader.

Figure 59. ST25DV-DISCOVERY Picture Transfer demonstration



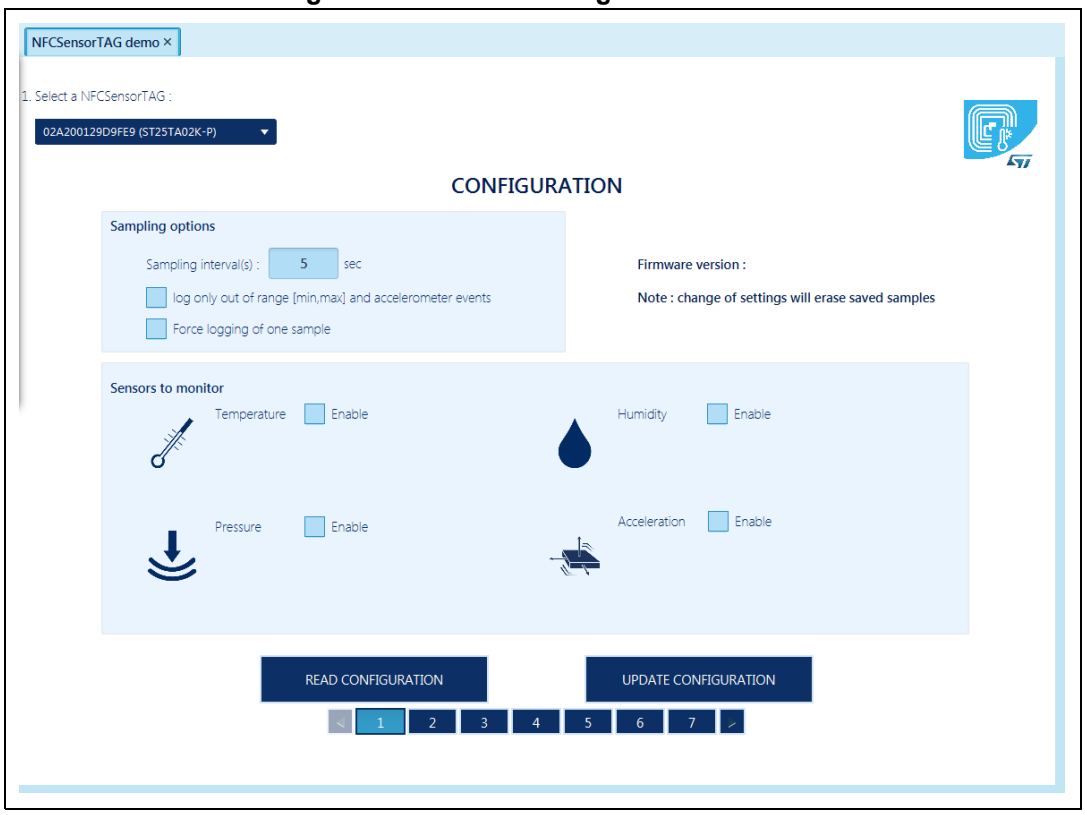
FTM - Stop Watch menu displays an user interface to demonstrate the clock synchronization using the ST25DV-I2C's Fast Transfer Mode mailbox.

Figure 60. ST25DV-DISCOVERY Stop Watch demonstration

6.1.2 STEVAL-SMARTAG1 menu

STEVAL-SMARTAG1 menu displays an user interface to play with the EVAL-SMARTAG1 board. Note that this board embeds an ST25DV-I2C used to store the demonstration parameters and the measured data, and to operate as RF interface between the RF reader and the demonstration board.

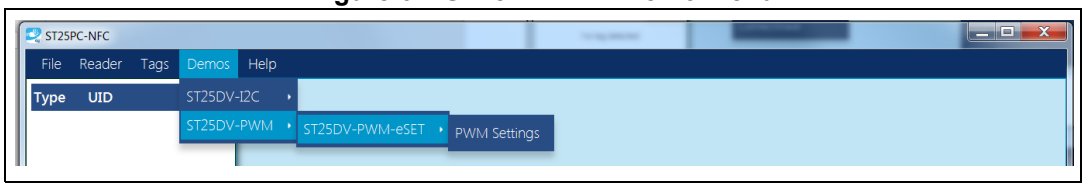
Figure 61. NFC sensor tag demonstration



6.2 ST25DV-PWM menu

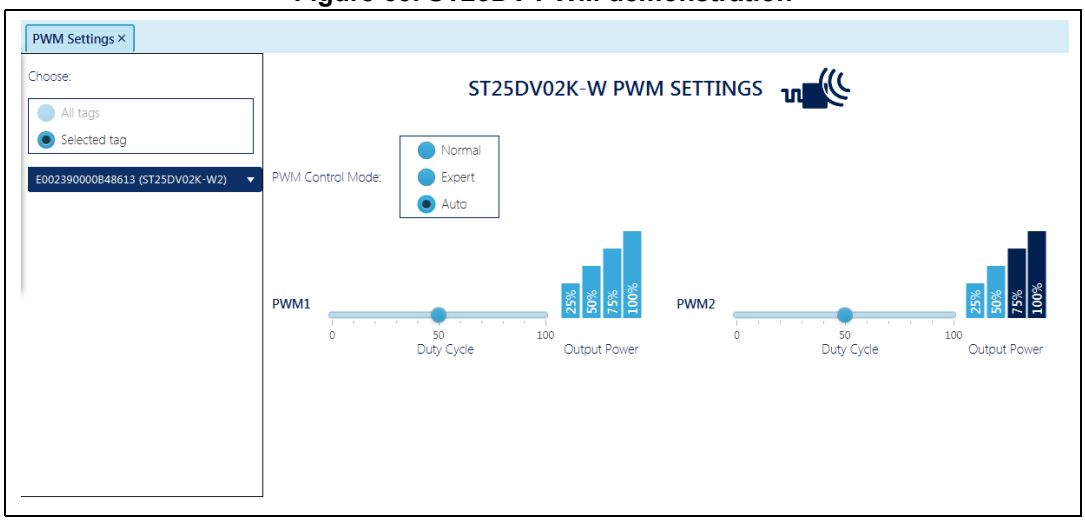
ST25DV-PWM menu displays a sub-menu containing the name of some demonstration boards. The ST25DV-PWM-eSET is the board to be used to play with this demonstration.

Figure 62. ST25DV-PWM Demo menu



PWM Settings menu displays an user interface to play with the ST25DV-PWM-eSET board.

Figure 63. ST25DV-PWM demonstration



7 Revision history

Table 1. Document revision history

Date	Revision	Changes
13-Sep-2018	1	Initial release.