

## Software toolbox for NFC tags

## Introduction

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

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

ST25PC-NFC operates with the products listed in *Table 1*.

Туре	Applicable products
	ST25TA, ST25TB, ST25TN and ST25TV series NFC tags
NFC/RFID tags	ST25DV-I2C and ST25DV-PWM series Dynamic NFC Tags
	M24LR and M24SR series Dynamic NFC Tags

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## 1 Quick start

Once the software is installed (see Section 3), connect your USB reader (one from the list in Section 2.1) 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, 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

ST25PC-NFC is a 64-bit application based on Java™ ST25 SDK. It can be used with all readers supported in the SDK:

- ST demonstration boards for ST25R95 (CR95HF), ST25R3911B-DISCO, ST25R3916-DISCO, STEVAL-25R3916B, and STEVAL-25R200
- FEIG ELECTRONIC readers: MR102, LR1002, CPR30/30+/30pro

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 3
- NFC Forum Type 2
- NFC Forum Type 1

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 2 CC File reader
  - 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:

- ST25DV-I2C
  - Fast transfer mode
  - Multi area editor and area configuration
- ST25DV-PWM
  - PWM settings
- ST25TV
  - Tamper detect
  - Counter
  - Electronic article surveillance
  - Untraceable mode
- ST25TVC
  - ANDEF configuration
  - Lock configuration
  - Privacy configuration
  - Tamper detect
  - Unique tap code
- M24LR series
  - Sector management
- ST25TN series
  - ANDEF configuration
  - Kill commands
  - Lock configuration
  - Memory configuration
  - Register editor
  - Signature
- ST25TA series
  - Access rights management
  - GPO features
- 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 and SMARTAG2 (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
  - ST25R95 (CR95HF)
  - ST25R3911B-DISCO
  - ST25R3916-DISCO
  - STEVAL-25R3916B
  - STEVAL-25R200
- FEIG ELECTRONIC
  - OBID MR102 (ISO 15693 only)
  - OBID LR1002 (ISO 15693 only)
  - OBID USB CPR30/30+/30pro





## 3 Installation

## 3.1 Download

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

Click on the *Get Software* button for the STSW-ST25PC001 (see *Figure 2*), then accept the license agreement.

				Get Soft	Wa	are				
Part Number	•	Software Version	¢	Marketing Status	¢	Supplier 🖕	Software Type	¢	Download	
STSW-ST25PC001				Active		ST	Windows installer		Get Software	
STSW-ST25PC002				Active		ST	Source code		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\STMicroelectronics\ST25PC-NFC\*. This directory can be changed 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), and also 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)



	Figure	3. Licer	nse agi	reement
--	--------	----------	---------	---------

License Agreement Please read the following important infor	mation before continuing.	
Please read the following License Agreen agreement before continuing with the ins	ent. You must accept the terms of this stallation.	
LICENSE AGREEMENT		
This software delivery contains various a license agreements. The terms and conc available below, as well as in the header accompanying this delivery.	oftware that are subject to different litions of those license agreements are files and documentation file	
(i) FOR THE SOFTWARE PROVIDED IN S TERMS OF ST MYLIBERTY SOFTWARE LI BELOW);	OURCE AND IN OBJECT CODE : THE CENSE AGREEMENT (REPRODUCED	Ŧ
<ul> <li>I accept the agreement</li> </ul>		
I do not accept the agreement		

#### Figure 4. Install folder

🦲 Setup - ST	25PC-NFC	
Select De Where	estination Location should ST25PC-NFC be installed?	Life.ougmented
	Setup will install ST25PC-NFC into the following fo	older.
To cont	tinue, click Next. If you would like to select a differe	ent folder, click Browse.
C:\Pro	gram Files (x86)\STMicroelectronics\ST25PC-NFC\	Browse
At least	t 238.9 MB of free disk space is required.	
	< <u>B</u> ack	Next > Cancel





Figure 5. Installation completed



## 4 GUI overview

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

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

ST25PC-NFC	3]	- 0	×
File Reader Tags Demos	Help		
Type UID			
No tag detected			
, in the second se			
2			
	4		
Select Inventory Protocols:			
ISO15693/NFC Type5			
ISO14443-A/NFC Type2 & Type4A ISO14443-B/NFC Type4B			
ISO14443-B/SRi/ST25TB			
ISO18092/TYPE3			
Scan Once			
Continuous Scan			
commous scan	4		
	1 READER: ST25R391	IB-DISCO CON	NECTED

#### Figure 6. ST25PC-NFC main window

## 4.1 Application start

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

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.



ST25PC-NFC	-		×
File Reader Tags Demos Help			
Type UID			
No tag detected			
Select Inventory Protocols:			
ISO15693/NFC Type5			
ISO14443-A/NFC Type2 & Type4A ISO14443-B/NFC Type4B			
ISO14443-B/SRI/ST25TB			
PICOPASS			
Scan Once			
Continuous Scan			
READER: ST25F	3911B-DIS	CO CONI	NECTED

Figure 7. ST25R3911B-DISCO RF reader detected

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

Figure 8. No RF reader detected







Figure 9. No RF reader 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 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. Default selected protocol can be changed using *Preference* panel available in *File* menu (see *Section 4.3.1*).



Type UID	
No tag detected	
4	
Select Inventory Protocols:	
<ul> <li>ISO15693/NFC Type5</li> <li>ISO14443-A/NFC Type2 &amp; Type4A</li> <li>ISO14443-B/NFC Type4B</li> <li>ISO14443-B/SRi/ST25TB</li> <li>TYPE1/TOPAZ</li> <li>ISO18092/TYPE3</li> <li>DICODASE</li> </ul>	
Scan Once 2 Continuous Scan 3	

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

- ISO15693 / NFC Forum Type5
- ISO14443-A / NFC Forum Type2 and Type4A
- ISO14443-B / NFC Forum Type4B
- ISO14443-B / SRi / ST25TB series
- NFC Forum Type1 / TOPAZ
- ISO18092 / NFC Forum Type3
- PICOPASS

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



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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 are executed

The *Scan Once* button [2] executes the detection only once. Choose *Continuous Scan* [3] to cycle through the protocols indefinitely (or until you press the 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 (see *Figure 11*).

sequentially) by clicking on the check-boxes.



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 with more details about the tag appears (see *Figure 12*), where UID, product name and type (RF protocol family) are displayed. Depending on tag type, additional information is displayed.

Type UID		
02E3000209F1DE	UID	E002390000780CC3
E00259587D933C28	Product Name	ST25DV02K-W2
E002230000539EB2	Туре	NFC type5 - ISO/IEC 15693
E002390000780CC3	Manufacturer	STMicroelectronics
	Memory size	64 blocks (2048 bits)
	IC Reference	0x39
	Product Code	0x39
	Block size	4 bytes
	AFI	0xAE
	DSFID	0x00
Select Inventory Protocols:		opy to Clipboard
ISO15693/NFC Type5		
ISO14443-A/NFC Type2 & Type4A		
ISO14443-B/NFC Type4B		
ISO14443-B/SRi/ST25TB		
TYPE1/TOPAZ		
ISO18092/TYPE3		
PICOPASS		
Scan Once		
Continuous Scan		





### 4.2.2 Tag contextual menu

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



Figure 13. Contextual menu

From this 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.



### 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 are available for selection.

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

#### Figure 14. Contextual menu



- 1. Part [1] contains *Preference* menu. Exit function is also available (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 File menu

Uses File menu to set default preferences or to exit.

#### Figure 15. File menu

[	📿 ST2	5PC-NFC				<u>.</u>	×
	File	Reader	Tags	Demos	Help		
	Prefe	erences					
		1					
l							

Preferences menu contains default settings.

Console part allows the user to display the console on the main window of the application, and to see all RF transactions. The user can change the size of the text and the position of the console (see *Figure 16*).



PreferencesFx	_	
		C
Console		
Show console	$\bigcirc$	
Console position in main window	Bottom	-
Console font size (needs restart)	· · · · · · · · · · · · · · · · · · ·	14
Inventory		
Continuous Scan delay in milliseconds	500	*
Detect Iso15693/NFC Type5 tags		
Detect Iso14443-A/NFC Type2 and Type4A tags	$\bigcirc$	
Detect Iso14443-B/NFC Type4B tags	$\bigcirc$	
Detect Iso14443-B/SRi/ST25TB tags		
Detect NFC Type1/TOPAZ tags		
Detect NFC Type3 tags		
Detect Picopass tags	$\bigcirc$	
Debug		
Show Exception dumps in console	$\bigcirc$	
	Close	Canc

Figure 16. Console

Inventory determines the RF protocols selected by default when the ST25PC-NFC application is launched. A delay parameter can be set to change the speed of the inventory loop.

Debug option can be set to display debug informations in the console.

### 4.3.2 Reader menu

Use the *Reader* menu (*Figure 17*) to connect/disconnect RF readers.

Reader Tag	js Demos	- Uplo			1
		nep			
Disconnect					
nformation					
	gs				
Reader Tools					
ר ק	iisconnect Iformation eader Settin eader Tools	iformation eader Settings eader Tools	isconnect Iformation eader Settings eader Tools	isconnect Iformation eader Settings eader Tools	isconnect Iformation eader Settings eader Tools

### Figure 17. Reader menu





- *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 settings on specific readers.
- Reader Tools menu allow the user to set and reset RF field (see Figure 18).

Reader Tools ×		
RF FIELD & PROTOCOL MANA	Ö	
SET RF FIELD OFF THEN ON	RF OFF / ON	
SET RF FIELD OFF	RF OFF	
SET RF FIELD ON	RF ON	
STATUS :	RF OFF	
CHECK SELECTED RF PROTOCOL READER_	MODE_ISO15693_MODE	

#### Figure 18. Reader Tools menu



### 4.3.3 Tags menu

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

ST25	PC-NFC							-	
ile	Reader	Tags D	emos Help	þ					
/pe	UID	NDEF Edi	tor						
		User Men							
	No tao d	ISO15693		• AFI & DSFID Edite	or				
NO LAG C	ISO14443	-A/Type2	Command List						
		ISO14443	-A/Type4A	• Type5 CC File Ed					
		ISO14443	-B/Type4B	• Password Manag	er				
		ISO14443	-B ST	• Register Editor					
		NFC Type		• Unitary Comman	ds				
		PICOPAS	5	* ST25DV-I2C		Area Configuration			
				ST25DV-PWM		Fast Transfer Mode			
				ST25TV		Multi Area Editor			
				ST25TVC		Specific Commands			
				M24LR					

Figure 19. Access ST25DV-I2C features from the Main menu bar

### 4.3.4 Demos menu

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

🛒 ST.	25PC-NFC					-	×
File	Reader	Tags		Help			
Туре	UID				ST25DV-DISCOVERY ·		
			ST25DV	-PWM	STEVAL-SMARTAG1		
	No tag d	etected			Device Configuration •		
Select Select IS0 IS0 IS0 IS0 IS0 IS0 IS0	Inventory Pro D15693/NFC D14443-A/NF D14443-B/NF D14443-B/NF D14443-B/SR PE1/TOPAZ D18092/TYPE	otocols: Type5 C Type2 & C Type4B i/ST25TB 3	k Type4A				

Figure 20. Demonstrations associated with the ST25DV-DISCOVERY board

See Section 6 for more details.



#### 4.3.5 Help menu

The *Help* menu (*Figure 21*) gives access to a CRC calculation tool (part [1]), provides relevant links to *www.st.com* (part [2]) and displays (part [3]) *About* informations.

<u></u>						
ஜ ST	25PC-NFC					×
File	Reader	Tags	Demos	Help		
Туре	UID			CRC Calculation tool		
				Web Resources • 2		
				About 3		

Figure 21. Help menu

CRC Calculation tool allows the user to calculate the CRC16 value for specific RF protocols.

CRC calculation tool ×		
CRC CALCUL	ATION TOOL	ana Proto
1122334455		COMPUTE CRC
CRC ISO15693 CRC ISO14443-B	B28B         CRC ISO14443-A         9344         CRC PICOPASS         8752	

Figure 22. CRC calculation tool

Web Resources menu (Figure 23) contains links to the www.st.com website.

- 1. Part [1] is a link to the ST25PC-NFC resources, such as user manual, web page for download and st25sdk library used by the ST25PC-NFC software.
- 2. Parts [2], [3] and [4] are a series of links to *www.st.com*, enabling fast access to data (e.g. datasheet, application notes, resources) about tags, dynamic tags and readers
- 3. Part [5] is the link to ST community forum. This web site is used by users to ask questions about STMicroelectronics products and firmwares. The user can read questions and answers about this application, or ask new questions.



ST25PC-NFC				-	×
File Reader Tags Demos	Help				
Type UID	CRC Calculation tool				
	Web Resources	RESOURCES			
No tag detected	About	User Manual			
no ag ociccio		ST25PC-NFC's home page	1		
		Java ST25 SDK			
		ST25TV Tag IC Series			
		ST25TN Tag IC Series			
		ST25TA Tag IC Series	2		
		ST25TB Tag IC Series			
Select Inventory Protocols:					
✓ ISO15693/NFC Type5		ST25DV-I2C D-tag IC Series			
ISO14443-A/NFC Type2 & Type4A		ST25DV-PWM D-tag IC Series			
ISO14443-B/SRi/ST25TB		M24LR D-tag IC Series	3		
TYPE1/TOPAZ		M24SR D-tag IC Series			
PICOPASS					
Scan Once		NFC/RFID Reader Series	4		
Continuous Scan					
		ST Community	5		
Reset RF Field					

Figure 23. Web resources menu

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

ST25PC-NFC			×
File Reader Tags Demos	Help		
Type UID	CRC Calculation tool		
	About About ST25PC-NFC Version: 2.4.0-4de528ee st25sdk version: 1.8.0		
	Extra sdk features:		
	Autnor: STMicroelectronics, (c) December 2020 www.st.com		

Figure 24. About menu



## 5 Tags menu

The Tags menu (see Figure 25) 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





### 5.1 NDEF editor

The NDEF editor user interface (*Figure 26*) can read NDEF messages from any kind of tag. This user interface can also be used to create or modify a NDEF message.

NDEF Editor ×	
Target all tags     Select a tag     E00259587D933C28 (M24LR04E)	Estimated NDEF size: 0 Bytes View hexadecimal content of composed NDEF 5
Your Tag Max NDEF size: 0 Bytes	Compose your NDEF message Add, edit. delete or reorder some records
1	2 Edit 3 4 More selected
No NDEF record	Write         Command Status:
Read from selected tag	Add new record

#### Figure 26. NDEF editor



*Read from selected tag* button allows the user to read the NDEF message from the selected tag. If an NDEF message is detected, the NDEF message details are displayed in part[1] of *Figure 26*.

Thanks to *Edit* button (part[2]) it is possible to duplicate the detected NDEF message in the edition part of the user interface (part[3]).

The user can modify the NDEF message with following features:

- Add new record button allows the user to modify the NDEF message by adding one or more NDEF records. *Figure* 27 displays the list of supported NDEF records available to populate the NDEF message, while *Figure* 28 shows a new message built.
- *Move selected record* (part[4]) can be used to change the record list. When an NDEF message has been prepared, user can write it to selected tags with a click on the *Write* button (part [2]).

🔳 Selec	t a record type	—	×
	URI NDEF record		
	Text NDEF record		
<u>8</u>	vCard NDEF record		
8	BLE NDEF record		
8	BT NDEF record		
Empty	Empty NDEF record		
wife)	WIFI NDEF record		
$\searrow$	EMAIL NDEF record		

Figure 27. Supported NDEF records



<ul> <li>Target all tags</li> <li>Select a tag</li> </ul>	E00259587D933C28 (M24LR04E) 🔹				Estimated NDEF size: 38 Byt View hexadecimal content of comp	es osed NDEF		
	Your Tag	Max NDEF size: 0 Bytes			Compose your NDEF r Add, edit, delete or reorder some	nessage records		
					URI Record	21 bytes	×	
				Z	Text Record	12 bytes	×	
	No NDEF record		Edit					Move selected record
			Write					Ť
			Command Status:					
Re	ad from selected tag				Add new record			]

Figure 28. New message

Part[5] allows the user to decode the NDEF message and displays all the TLV information of each NDEF record (see *Figure 29*).

Composed NDEF : Hexadecimal content           Hex         ASCI           03 21 91 155 01 73         :10.s           12 25 63 67 60 27 73 74         t.com/st           23 35 2D 64 65 60 67 51         25-demo0           01 08 54 02 65 62 48 65         :T.e.m.He           6C 6C 6F FE         110.           URI Record           MB         ME CF SR           MB         ME CF SR           MB         ME CF SR           10 0         0           110.         0	NDEF Hexadecimal View				—
Hex         ASCII           03 21 91 01 11 15 50 17 3         .1U.9           74 22 63 6F 02 P7 73 74         t.com/st           23 2D 64 65 6D 2F 73 74         t.com/st           01 03 54 02 65 6E 48 65        T.enHe           6C 6C 6F FE         116.		Composed N	IDEF	: Hexadecima	al content
03 21 91 00 11 55 00 77 3       1.10.1.s         74 2E 63 F 6D 2F 73 74       t.com/st         32 35 2D 64 65 6D FF 51       25-demoQ         01 08 54 02 65 6E 48 65      T.enHe         6C 6C 6F FE       110.         URI Record         http://www.st.com/st25-demo         11 0       0         12 0       1         13 0       0         14 0       0         15 Record Byte:       0x01         MB ME CF SR IL TNF         Type Length:       0x01         Payload Length:       0x11         10 Length:       1         10 Length:       0x55 ('U')         11 Lot       1	Hex	ASCII	1		
	03 21 91 01 11 55 01 73 74 2E 63 6F 6D 2F 73 74 32 35 2D 64 65 6D 6F 51 01 08 54 02 65 6E 48 65 6C 6C 6F FE	.lU.s t.com/st 25-demoQ T.enHe llo.		1st Record Byte : Type Length : Payload Length : ID Length : Type : ID : Payload : (17 Bytes)	URI Record http://www.st.com/st25-demo 0x91 1 0 0 1 0 001 MB ME CF SR IL TNF 0x01 0x11 0x55 ('U') 0x01 0x73 0x74 0x2E 0x63 0x6F 0x6D 0x2F 0x73 0x74 0x32 0x35 0x2D 0x64 0x65 0x6D 0x6F

Figure 29. NDEF record info



## 5.2 User memory

The *User Memory* interface is used to read, write or update the content of any tag. *Figure 30* shows the read and write user interface of the EEPROM of a tag.



Figure 30. 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.

*Write File to memory* allows the user to copy the content of a binary file in the memory of the tag. the *At block* parameter defines the address where the first data is written.

*Write pattern to memory* feature allows the user to fill the memory with a single byte pattern (useful to erase the whole memory to 0x00 or 0xFF). Be careful not to delete CC file data.

To be able to modify the content of the memory double click on the block to be changed. A pop-up window appears to change data.

*Figure 31* shows the *File operation* user interface for tag. This UI allows the user to transfer the content of a file in the tag memory. The tag memory can also be stored in a binary file.



ect a tag: E0022400026EC88F (ST25DV04K-I)	Area	Block	Data	ASCII
Tag size: 128 blocks	01	00	E1 40 40 00	á@@.
3	01	01	03 B0 91 01	.° 2.
Addressing mode 💿 Blocks 🛛 🔵 Bytes	01	02	11 55 01 73	. U . s
	01	03	74 2E 63 6F	t.co
Jnit selection 🕘 Hexadecimal 🔵 Decimal	01	04	6D 2F 73 74	m/st
	01	05	32 35 2D 64	25-d
From block: Ux 0	01	06	65 6D 6F 11	emo.
Size (in blocks): 0x 80	01	07	01 08 54 02	T.
	02	08	65 6E 48 65	enHe
Sector security status	02	09	6C 6C 6F 52	lloR
Read memory	02	ØA	0C 80 74 65	. 🛛 t e
	02	ØB	78 74 2F 78	xt/x
At block: 0x 0	02	0C	2D 76 43 61	-vCa
A DIOCK.	02	0D	72 64 42 45	r d B E
Write File to memory	02	ØE	47 49 4E 3A	GIN:
	02	ØF	56 43 41 52	VCAR
	03	10	44 0A 56 45	D.VE
	03	11	52 53 49 4F	RSIO
Write pattern to memory	03	12	4E 3A 32 2E	N:2.
	03	13	31 ØA 4E 3A	1.N:
Dump Data Table to File	03	14	4D 72 3B 44	Mr;D
	03	15	75 72 61 6E	uran
Compare Data Table with File	03	16	64 3B 0A 46	d ; . F
	03	17	4E 3A 4D 72	N:Mr
ommand Status:	03	18	20 44 75 72	Dur
	03	19	61 6E 64 ØA	and.

Figure 31. File operation

*Dump Data Table to File* allows the user to store the content of data displayed in the user interface in a binary file.

*Compare Data Table with File* allows the user to compare the data displayed in the user interface with a binary file.

### 5.3 ISO 15693 / NFC Type 5

ISO 15963 / NFC Forum Type 5 can be divided in two parts, as shown in *Figure* 32:

- 1. 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.
- 2. Part [2] lists the STMicroelectronics product series and contains specific features for each of them.



Figure 32. ISO 15693 / NFC Type 5 menu

ஜ ST2	5PC-NFC			-	
File	Reader	Tags Demos Hel			
Туре	UID	NDEF Editor			
		User Memory			
	No tao d	ISO15693/NFC Type5	AFI & DSFID Editor		
	INO Lagic	ISO14443-A/Type2	Command List		
		ISO14443-A/Type4A	• Type5 CC File Editor		
		ISO14443-B/Type4B	Password Manager		
		ISO14443-B ST	• Register Editor		
		NFC Type3	• Unitary Commands		
		PICOPASS	* ST25DV-I2C •		
			ST25DV-PWM		
			ST25TV ,		
			ST25TVC •		
			M24LR		

### 5.3.1 Generic features

AFI & DSFID Editor menu allows the user to read, modify or lock the AFI and DSFID data (see *Figure 33*).



Type5 AFI DSFID ×	
Select a tag: E0022400026EC88F (ST25DV04K-I)	TYPE5 AFI & DSFID EDITOR
	COMMAND STATUS :
AFI 00 WRITE AFI	LOCK AFI
DSFID 00 WRITE DSFID L	OCK DSFID GET AFI & DSFID



*Commands List* menu (see *Figure 34*) can be used to get the meaning of command list data available on latest Type 5 products.

a tag:	E002	22400026EC88F (ST25DV04K-I)			TYPE5 COMMAN	ID LIST
[		Byte 1 = 0xFF	Value		Byte 2 = 0x3F	Value
	b1	Read single block is supported	1	b1	Write AFI is supported	1
	b2	Write single block is supported	1	b2	Lock AFI is supported	1
	b3	Lock single block is supported	1	b3	Write DSFID is supported	1
1	b4	Read multiple block is supported	1	b4	Lock DSFID is supported	1
	b5	Write multiple block is supported	1	b5	Get system information is supported	1
	b6	Select is supported	1	b6	Custom command are supported	1
	b7	Reset to Ready is supported	1	b7	RFU	0
[	b8	Get multiple block security status is supported	1	b8	REU	0
[		Byte 3 = 0x3F	Value		Byte 4 = 0x00	Value
	b1	Extended read single block is supported	1	b1	Read Buffer is supported	0
	b2	Extended write single block is supported	1	b2	Select Secure State is supported	0
	b3	Extended lock single block is supported	1	b3	Final Response always includes crypto result	0
	b4	Extended read multiple block is supported	1	b4	AuthComm crypto format is supported	0
	b5	Extended write multiple block is supported	1	b5	SecureComm crypto format is supported	0
	b6	Extended get multiple block security status is supported	1	b6	KeyUpdate is supported	0
	b7	RFU	0	b7	Challe,ge is supported	0
	b8	RFU	0	b8	If set to 1 a further Byte is transmitted	0

Figure 34. Commands list menu

*Type 5 CC File Editor* menu displays a user interface useful to manage the CC file of any Type 5 tag (see *Figure 35*). Vicinity tags such as those of the M24LR series are also supported.



Figure 35. 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 writes the CC File as displayed on the screen in your selected tag. Extended CC file with an 8-byte formatted CC file is supported.

*Password Manager* menu (see *Figure 36*) displays a specific user interface to manage passwords. It is a generic tool that can be used on many STMicroelectronics products.

Password Mgt ×							
				PASS	WORD MA	NAGEMENT	
Select Tag:	E0022400026EC88F (ST25DV	/04K-I) ▼	J				
	Configuration password						
	Password #1						
Select Password:	Password #2						
	Password #3						
		byte 0			byte 7		
	Password Data:	17 47	56 09 (	67 09 8	5 78	Fill with 00	
	Present Pass	word		C	hange Password		

#### Figure 36. Password management

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

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

Password data field is used to set the value of the password to use.

*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 is used to manage specific registers of select tag. *Figure 37* is an example of the user interface for the ST25DV-I2C series. This interface is built according to the selected tag (static, dynamic registers).

Registor Editor ×						
Select Tag:	Stati	registers Dynamic r	registers	GPO	С	
E0022400026CC302 (ST25DV04 🔻		Neme		Bit	Flag Name	Value (Bin)
Read All Registers Write All Registers	00 01 02 03 04 05 06	GPO IT_Time EH_MODE RF_MNGT RFA1SS EndA1 RFA2SS EndA2	B0         Image: Control of the c	0 1 2 3 4 5 6 7	RF_USER_EN RF_BUSY_EN RF_INTERUPT_EN FIELD_CHANGE_EN RF_PUTMSG_EN RF_GETMSG_EN RF_WRITE_EN GPO_EN	0 0 0 1 1 0 1
	08 09 0A 0E	RFA3SS EndA3 RFA4SS MB_WDG	00 0F 00 00	Bit	Description	
	Enab	Read Register	UON PO Write To Tag	0: 6 (CN 1: 6 ena	iPO output is disabled IOS), 0 (Open Drain) iPO output is enabled. bled interrupts	. GPO is High-Z . GPO outputs

Figure	37	Register	editor
Iguie	57.	Negister	cuitor

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.

*Unitary Commands* menu displays a 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 box contains ISO 15693, Type 5 and STMicroelectronics proprietary commands. The user interface is automatically updated will all the field. The user can fill each field and send the command to the tag present within the reach of the reader RF antenna.



*Unitary Commands* menu is helpful to send any ISO15693 command or any proprietary command to the tags. *Figure 38* shows an example of the read multiple block command.

lect	sets of comm	ands: VEC Forum Type 5	Sort commands by Name	e 🕒 Code	RF Response
/te	Meaning	RF Command Bytes	Value	Description	SUCCESS Bespeere Data:
D	- Request Flag	02	Two sub-carriers (b1)           ✓         High data rate (b2)           Inventory (b3)           Protocol extension (b4)           Option (b7)           RFU (b8)	Set up request flag	nesponse Jaka. Status byte: 00 Data: E14040000380910111550173742E636F60 27737432352D64656D6F1101085402656 48656C6C6F520C8074657874E782D764 3617264424547494E3A56434152
2	1st Block Address	00	<ul> <li>Hexadecimal</li> <li>Decimal</li> </ul>	Address of first data block	
3	Number of blocks	OF	Hexadecimal     Decimal     OF	Number of blocks minus 1: 0 = 1 block 1 = 2 blocks  n = n + 1 blocks	
	0223000F			Preview Send	

Figure 38. ISO 15693 unitary commands

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

Send button sends 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:

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



ஜ ST2	5PC-NFC			-	×
File	Reader	Tags Demos Help			
Туре	UID	NDEF Editor			
		User Memory			
	No tao d	ISO15693/NFC Type5	AFI & DSFID Editor		
	NO lag o	ISO14443-A/Type2	Command List		
		ISO14443-A/Type4A	Type5 CC File Editor		
		ISO14443-B/Type4B	Password Manager		
		ISO14443-B ST	Register Editor		
		NFC Type3	Unitary Commands		
		PICOPASS	ST25DV-I2C Area Configuration		
			ST25DV-PWM  • Fast Transfer Mode		
			ST25TV   Multi Area Editor		
			ST25TVC , Specific Commands		
			M24LR •		

*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 40* shows an example of ST25DV04K configured with three areas, not protected by any password.



Figure 40. Area configuration



Area protection column can be used to change the protection of areas, while *Password Number* column can be used to select the password number. *Write to Tag* button applies the modifications done in the user interface to the tag.

The *Multi Area Editor* menu displays a user interface useful to configure the memory partition for ST25DV-I2C Dynamic tags.

*Figure 41* 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.





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.

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*Fast Transfer Mode* menu displays a user interface able to manage the mailbox of the FTM (fast transfer mode) 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 42* 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 and check its behavior when using the FTM.

ransfer	Node ×	
t a tag:	E002260001608F8C (ST25DV64K-I)	FAST TRANSFER MODE
ad messag	Write message	MR Control Dur
READ	MESSAGE LENGTH 245 bytes	Enable MB
		Bit Flag Name Value
	EAD MESSAGE Offset: 0x 00 Number of Bytes: 1	read whole message 0 MB_EN 1
		1 HOST_PUT_MSG 0
Offset	Data ASCII	2 RF_PUT_MSG 0
00×00	09 00 00 01 00 01 8B AC 01 B5 00 2C E8 D9 8B E2 E	I¬.μ., ėU⊠ä 4 HOST MISS MSG 0
0×10	5C 1F 19 FF 00 66 DF 87 FE 2F 86 7F 36 0F 14 F8 \ y . T 8	Û G / 9 C 2 7 G 5 REMISS MSG 0
0x30	5D CD 7C AB 4D 3B 33 D4 DC FC EA F8 E9 A7 36 93 1 1 1 ( M : 3	
0×40	F1 A3 C5 70 11 B7 1A B5 CB 28 FF 00 65 A5 66 5F ñ f Å p	μË (ÿ, e¥f_ 7 RE CHIPPENT MSG 1
0x50	D0 8A E5 2B D6 FF 00 6D CF 0B 9F 0E FC 7F D4 26 D D å + Ö ÿ .	mÏ. D. ü Ô&
0×60	DB 88 F5 68 21 BC 4E 38 FB BE 5B 7F E3 D1 B1 FC 0 0 6 h 1 % N	8 û % [ ã Ñ ± ü Bit Description
0x70	6B C9 2B FC A2 E3 BC BA 58 0E 23 C7 60 E4 AD C9 k É + ü ¢ ã ½	° X . # Ç ` ä - É
0x80	56 A2 5E 9C CD A7 F3 56 67 A3 07 78 A3 EB EF 85 V ¢ ^ 应 Í § á	Vg£.x£ëï0
0x90	9F 15 5B E0 CF EC 47 A2 EB 91 D9 AD F4 B1 49 34 🛛 . [à Ïì G	¢ë 🛛 Ú - ô ± I 4
0xA0	49 13 49 B1 49 7B C9 46 49 C1 E9 CD 72 1F F0 F1 I.I±I{É	FIA é Ir.ð ñ
0xB0	9D 57 FE 85 9D 3F FF 00 02 9F FC 28 D6 BF E5 1D 🛛 W 🖕 🖾 ? ÿ	🛛 ü ( Ö ¿ å .
0xC0	3A 47 FD 7D B7 FE 96 CD 5F 38 57 ED 7C 6D E2 67 : G ý } ⋅ ♭ ₪	I_8Wí mâg
0xD0	12 F0 FE 1F 28 C0 E5 18 A7 4A 9B C0 E1 A5 6E 58 . ðþ. (A å	.§JDAá¥nX
0xE0	3F 79 C5 A6 EF 28 B7 B2 5D 6C 65 0A 71 93 6D F7 ? y A ¦ ï ( ·	<sup>∠</sup> ] ⊥ e . q ⊠ m ÷
0x⊦0	3E 8F FF 00 8/ ≥ Üÿ. D	READ REGISTER



# 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 a user interface that can be used to manage PWM (pulse width modulation) configuration.
- *Signature menu* allows the user to read and verify the TruST25 signature. To activate this feature contact your ST sales office.



Figure 43. ST25DV-PWM menu

ST2	PC-NFC								_	- 0
File	Reader	Tags Demos	Help	)						
Туре	UID	NDEF Editor								
		User Memory								
	No tao d	ISO15693/NFC		AFI & DSFID Edito	r					
	no log o	ISO14443-A/Ty	/pe2	Command List						
		ISO14443-A/Ty	/pe4A	* Type5 CC File Edit						
		ISO14443-B/Ty	rpe4B	Password Manage						
		ISO14443-B ST		• Register Editor						
		NFC Type3		• Unitary Command	ds					
		PICOPASS		ST25DV-I2C	9					
				ST25DV-PWM		Area Configuration				
				ST25TV		Pwm Settings				
				ST25TVC		Signature				
				M24LR	•					

Use *PWM Setting* menu to configure the PWM feature of a selected ST25DV-PWM tag.

*Figure 44* shows the PWM features of the ST25DV02K-W2. This product contains two PWMs, while the ST25DV02K-W1 contains only one.



#### Figure 44. 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 45*) 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, to read and verify the TruST25 signature. To activate this feature contact your ST sales office.
- Tamper Detect menu
- Untraceable Mode menu

ஜ ST25	PC-NFC					-	×
File	Reader	Tags Demo	s Help				
Туре	UID	NDEF Editor					
		User Memory					
	No tao d	ISO15693/NFC		AFI & DSFID Editor			
	NO LOG O	ISO14443-A/T	ype2	Command List			
		ISO14443-A/T	ype4A	• Type5 CC File Editor			
		ISO14443-B/T	ype4B	Password Manager			
		ISO14443-B S		Register Editor			
		NFC Type3		Unitary Commands			
		PICOPASS		ST25DV-I2C	<ul> <li>International Control of Contro</li></ul>		
				ST25DV-PWM	•		
				ST25TV	Area Configuration		
				ST25TVC	Counter		
				M24LR	Electronic Article Surveillance		
l					Kill command		
					Signature		
					Tamper Detect		
					Untraceable Mode		

Figure 45. ST25TV menu

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



Figure 46. S	51251V counter
Counter ×	
Select a tag: E002230000539EB2 (ST25TV02K)	ST25TV Counter
Value 00000	
Clear	Read

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



*Electronic Article Surveillance* menu displays the user interface, as shown in *Figure* 47. This UI allows the user to read the EAS telegram, to configure it, and to set specific protections.

Figure 47. S1251V electrical article signature
EAS Features ×
Select a tag:           E002390000848613 (ST25DV02K-WZ)
READ EAS Read the Electronic Article Surveillance telegram
Read EAS TELEGRAM TELEGRAM
💿 ASCII 🔵 HEXA
SET EAS CONFIGURATION Configure the Electronic Article Surveillance features (telegram, size and ID), activativation or desactivation
Write EAS CONFIG         EAS Configuration         256-bit EAS telegram length
Write EAS TELEGRAM TELEGRAM
Write EAS ID EAS ID 0000 OK ASCI O HEXA
Set EAS MODE Reset EAS MODE
PROTECT EAS CONFIGURATION Protect the Electrical Article Surveillance configuration with a password
Read EAS register EAS Register value
Change EAS protection value EAS configuration not write protected
LOCK EAS CONFIGURATION Lock the Electrical Article Surveillance configuration definitly
Lock EAS CONFIGURATION Advanced read EAS features

Figure 47. ST25TV electrical article signature

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



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

Kill command ×	
Select a tag: E002230000539EB2 (ST25TV02K)	Kill Command
Permanently kill this Tag (a confirmation will b	e asked)
Kill	
NB: On ST25TV tags, the 'Kill' and 'Untraceable	Mode' features are using the same password (password 0)
Change kill password	
Lock kill password	

Figure 48. 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 49* 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.

Tamper Detect ×         Select a tag:         E002230000539EB2 (ST25TV02K)         Tamper Detect
Tamper detect status (collected when the tag was powered ON):
Refresh





*Untraceable Mode* menu displays a user interface to manage Untraceable Mode feature. *Figure 50* shows this user interface.

Select a tag: E002230000539EB2	(ST25TV02K)  Untraceable Mode
WARNING! Once the devices. It will only a	e Untraceable Mode is enabled, the tag will no longer answer Android nswer special commands from NFC readers.
	Enable Untraceable Mode
To get out of the Ur transmitted to ST25	ntraceable Mode, a valid Untraceable Mode password has to be TV tags.
	Get out of Untraceable Mode
NB: On ST25TV tags (password 0)	;, the 'Kill' and 'Untraceable Mode' features use the same password
	Change Untraceable Mode password

Figure 50. ST25TV Untraceable Mode

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



### 5.3.5 ST25TVC menu

ST25TVC menu (*Figure 51*) displays a sub-menu containing all the specific features of the ST25TVC series:

- ANDEF Configuration menu
- Area Configuration menu (described in Section 5.3.2)
- *Kill command* menu (described in *Section 5.3.4*)
- Multi Area Editor menu (described in Section 5.3.2)
- Lock Configuration menu
- Privacy Configuration menu
- *Signature* menu, to read and verify the TruST25 signature. To activate this feature contact your ST sales office.
- Tamper Detect menu
- UID ANDEF menu
- Unique Tap Code menu
- Untraceable Mode menu (described in Section 5.3.4)

2 ST25	PC-NFC				-	_
File	Reader	Tags Demos	Help			
/pe	UID	NDEF Editor				
	1	User Memory				
	Neter	ISO15693/NFC T		AFI & DSFID Editor		
NO LAS	No tag c	ISO14443-A/Typ	be2	Command List		
		ISO14443-A/Typ	be4A	• Type5 CC File Editor		
		ISO14443-B/Тур	oe4B	• Password Manager		
		ISO14443-B ST		• Register Editor		
		NFC Type3		Unitary Commands		
		PICOPASS		* ST25DV-I2C	•	
				ST25DV-PWM	•	
				ST25TV	•	
				ST25TVC	ANDEF configuration	
				M24LR	Area Configuration	
					Kill command	
					Lock Configuration	
					Multi Area Editor	
					Privacy Configuration	
					Signature	
					Tamper Detect	
					UID Andef	
					Unique Tap Code	
					Untraceable Mode	

#### Figure 51. ST25TVC menu



ANDEF Configuration user interface allows the user to configure the Augmented NDEF features of the ST25TVC tag. With reference to *Figure 52*:

- Part [1]: configures the NDEF prefix and the NDEF URI content. This is the static part of the NDEF message containing an URI record.
- Part [2]: activates (or disactivates) the Augmented NDEF feature.
- Part [3]: configures the dynamic part of the NDEF message that completes (augments) the URI record.
- Part [4]: contains the size of the ANDEF part of the URI. The generated URL describes the final URL record that the tag displays with the activation of the ANDEF feature.

ANDEF Settings ×	
Select a tag: E00208000E94DDF2 (ST25TV02KC)	AUGMENTED NDEF CONFIGURATION
URI NDEF Prefix https://www.  myst25.cc	om/andef/index.php?data=E00208000E94DDF2K04S4B14CF5DF54EB7EF8232D64883E5
Enable Augmented NDEF venabled	
✓ Use separator between ANDEF elements	Character used as separator (ASCII)
Select the ANDEF elements to use :	Structure of your Augmented NDEF :
✓ UID     ✓ Custom message       ✓ Unique Tap Code     ✓ Tamper Detect	Prefix URL UL UL UL UL UL UL UL UL UL UL UL UL UL
ANDEF data size : 33 https://www.must2E.com/andof/i	
Generated URL : D99D26B90DD7B2DEE00208000E	inex.pniproata=couzoooucs+uDrzko+s+bi+(cr3Dr34EB/EF6232D04883550E1C/4A 94DDF2-12345678-yyy-CDG
	READ UPDATE

#### Figure 52. ANDEF configuration

*Read* button can be used to read the ANDEF configuration of the selected tag. The ANDEF configuration user interface changes according to the tag content.

Update button applies to the tag the change(s) done on the user interface.

Several items can be added or removed on ANDEF message, such as the tag UID, an 8-character custom message, the unique tap code value and the tamper detect characteristics:

- click on *Tamper Detect* picture to display Tamper Detect configuration user interface
- click on Unique Tap Code picture to display Unique Tap Code user interface
- click on UID picture to read the tag UID (Figure 53)
- click on Custom Message picture to edit Custom Message (Figure 54), and then click on Read / Update button, to, respectively, read / modify Custom Message value.







Figure 54. Custom Message





*Lock Configuration* user interface can be used to prevent modifications. This action is non-reversible.

ock Configuratio	n×		
Select Tag :	E00208000E94DDF2 (ST2	25TV02KC)	Lock Configuration
NAME	STATUS	SELECT TO LOCK	COMMENT
LOCKAFI	NOT LOCKED		FID 08h : AFI protection
LCKPRIV	NOT LOCKED		FID 05h : Privacy settings
LCKANDEF	LOCKED		FID 04h : Augmented NDEF
LCKTD	LOCKED		FID 03h : Tamper detection
LCKUTC	NOT LOCKED		FID 02h : Unique tap code activation
LCKA2R	NOT LOCKED		FID 01h : AREA2 protection and area sizes
LCKA1R	NOT LOCKED		FID 01h : AREA1 protection and area sizes
	Read co	onfiguration	Lock configuration * * Lock Configuration is irreversible.

Figure	55	Lock	config	uration
IIYUIE	JJ.	LUCK	COILING	luiauoii

*Read Configuration* button can be used to read the lock configuration of the selected tag. After selecting features to be locked, click on *Lock configuration* button to lock it.



*Privacy Configuration* user interface (*Figure 56*) can be used to configure the privacy settings of ST25TVC tags.

acy Configuration ×			
Select Tag : E00208000E94DDF2 (ST25 CONFIGURE PRIVACY CO	Privacy Configuration		
NAME	FUNCTION		
DISABLE_KILL	<ul> <li>1b : KILL feature is disabled</li> <li>0b : KILL feature is enabled</li> </ul>		
DISABLE_UUID	1b : Untraceable UID feature is disabled     0b : Untraceable UID feature is enabled		
DEFAULT_PRIVACY       11b : Privacy-by-default enabled when TD open         10b : Privacy-by-default enabled when TD short         01b : Privacy-by-default enabled         01b : Privacy-by-default enabled			
Rea	d configuration Update configuration		

Figure	56.	Privacy	Config	uration
iguic	<b>vv</b> .	1 1114409	Conne	anation

Read configuration button can be used to read the configuration of the selected tag.

After having modified the privacy parameters, click on *Update configuration* button to change the settings.



*Tamper Detect* menu demonstrates the behavior of the tamper detect feature. If an ST25TVC 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 ST25TVC tag to read the status of the detector. Depending on this status, the TDO/TD1 wire is shown as open or shorted. *Figure 57* shows an example of an ST25TVC tag with the *Tamper Detect* opened.

TAMPER DETECT	_	
	Tamper Det	ect
	Set character displayed for each event	
	when TD wire is open	G
	when TD wire is shorted	Н
	Set character displayed for history event	
ST25	when TD Event Update is sealed	EF
	when TD Event Update is unsealed	CD
	when TD Event Update is resealed	AB
STATUS : OPEN (G), EVENT : UNSEAL (CD)	V Event Update Enabled	
Read	Update	

Figure 57. Tamper Detect

Click on *Read* button to read again the tamper detect register and display its new status.

*Update* button can be used to personalize parameters such as the values for its state. *Tamper Detect* status and event are part of Augmented NDEF features and can be added as well.



*Unique Tap Code* (*Figure 58*) user interface can be used to read the value of the UTC or to enable/disable it.



*Read* button can be used to read the Unique Tap Code value, click on check-box to enable

or disable it.



# 5.3.6 M24LR menu

*M24LR* menu (*Figure 59*) allows the user to play with specific commands of the M24LR series or to manage sector passwords.

😂 ST2	5PC-NFC			-	×
File	Reader	Tags Demos Help			 
Туре	UID	NDEF Editor			
		User Memory			
	No tao c	ISO15693/NFC Type5	AFI & DSFID Editor		
	NO LOG C	ISO14443-A/Type2	• Command List		
		ISO14443-A/Type4A	• Type5 CC File Editor		
		ISO14443-B/Type4B	Password Manager		
		ISO14443-B ST	* Register Editor		
		NFC Type3	• Unitary Commands		
		PICOPASS	ST25DV-I2C		
			ST25DV-PWM		
			ST25TV •		
			ST25TVC •		
			M24LR Sector Management		
			Specific Commands		
			Energy Harvesting and GPO features		

Figure 59. M24LR menu



Sector Management menu (Figure 60) displays a user interface to manage the sectors of any M24LR tag.

	•	•	
M24LR Sector Mgt ×			
Select Tag : E0024C41F60B6147 (M2	24LR16E) 🔻	Sector Man	agement
SELECT SECTOR			
Sector number : Sector 0		•	
CONFIGURE SECTOR LOC	к		
Lock Sector :	✓ Yes		
Select Password number :	No password		Manage Passwords
	Password #1		
	Password #2		
	Password #3		
Select Lock Configuration :	Lock Config	Pwd Presented	Pwd Not Presented
	00	Read / Write	Read / No Write
	01	Read / Write	Read / Write
	10	Read / Write	No Read / No Write
	11	Read / No Write	No Read / No Write
Read se	ector configuration	Lo	ck sector

Figure 60. 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.

Energy Harvesting and GPO features menu (*Figure 61*) displays a user interface useful to manage GPO Mode and Energy Harvesting configuration.



24LR EH and GPO features ×	
Select a tag: E00259587D933C28 (M24LR04E)	M24LR : ENERGY HARVESTING & GPO
Configuration byte (EEPROM @0910) Read Configuration byte Write Energy Harvesting config Write Digital Output config	b7 b6 b5 b4 b3 b2 b1 b0 1 1 1 1 0 0 0 0 EH CONFIG 0 Imax = 7mA DO CONFIG 0 RFB usy mode RFU 1 1 1 1 Configuration byte : F0
Control register (RAM @0920)	b7 b6 b5 b4 b3 b2 b1 b0
Read Control register Set Energy Harvesting Reset Energy Harvesting	FIELD ON RFU Control register : 02

. .

#### ISO14443-A / Type 2 menu 5.4

ISO14443-A / Type 2 can be divided in two parts, as shown in Figure 62:

- Part [1] describes the user interfaces (described in detail in Section 5.4.1: Generic 1. features) available for Type 2 products.
- Part [2] lists the STMicroelectronics product series and contains specific features for 2. each of them.

🛒 ST2	5PC-NFC		_	>
File	Reader	Tags Demos Help		
Туре	UID	NDEF Editor		
		User Memory		
	No too d	ISO15693/NFC Type5 •		
	NO tay u	ISO14443-A/Type2 · Type2 CC File		
		ISO14443-A/Type4A · ST25TN · 2		
		ISO14443-B/Type4B ·		
		ISO14443-B ST •		
		NFC Type3 •		
1		PICOPASS ,		

Figure 62. ISO 14443-A / Type 2 menu



# 5.4.1 Generic features

Type2 CC File menu (see *Figure 63*) displays a user interface useful to read and decode the capacity container file of a Type 2 tag.

Type2 CC File Select a tag:	0487AB5A9	84081 (GENE	RIC_TYPE2)	•		ТҮРЕ	2 CAPACITY CONTAINER FILE EDITOR
	Block 0	Byte 0	Byte 1 10	Byte 2 3E	Byte 3		Byte 0 : Magic number
						E1	NFC Forum defined data is stored in the data area
						Other	No NFC Forum defined data is stored in data area
		READ C	C FILE				WRITE CC FILE



#### 5.4.2 ST25TN menu

ST25TN menu (see *Figure 64*) displays a sub-menu containing all the specific features of the ST25TN series.

- ANDEF Configuration
- Kill Command (described in Section 5.3.4: ST25TV menu)
- Lock Configuration
- Memory Configuration
- Register Editor (described in Section 5.3.1: Generic features)
- *Signature*, to read and verify the TruST25 signature. To activate this feature contact your ST sales office.



			Figure 64. ST25TN series menu							
🔹 ST2	5PC-NFC								-	×
File	Reader	Tags	Demos	Help						
Туре	UID	NDEF	Editor							
		User N	/lemory							
	No. 444	ISO15	593/NFC 1	Type5						
	NO tag c	ISO14			Type2 CC File					
		ISO14	443-А/Тур	e4A 🕠		ANDEF configuration				
		ISO14	443-B/Typ	e4B v		Kill command				
		ISO14	443-B ST			Lock configuration				
		NFC T	ype3			Memory configuration				
		PICOF	PASS	,		Register Editor				

ANDEF Configuration user interface allows the user to configure the Augmented NDEF features of the ST25TN tag. With reference to Figure 65:

- Part [1]: configures the NDEF prefix and the NDEF URI content. This is the static part 1. of the NDEF message containing an URI record.
- Part [2]: configures the dynamic part of the NDEF message that completes (augments) 2. the URI record.
- 3. Part [3]: contains the size of the ANDEF part of the URI. The generated URL describes the final URL record that the tag displays with the activation of the ANDEF feature.



#### Figure 65. Augmented NDEF configuration

Read button can be used to read the ANDEF configuration of the selected tag. The user interface changes according to the tag content.

Update button applies to the tag the change(s) done on the user interface.

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Several items can be added or removed on ANDEF message, namely an 8-character custom message (*Figure 66*) and the unique tap code value (*Figure 67*).

Click on *Custom Message* picture to edit it, and then click on Read / Update button, to, respectively, read / modify its value.

A unique tap code can be enabled or disabled using check box. The configuration (Enable / Disable) can be read, but the UTC value cannot be read directly (it is displayed in ANDEF message).



#### Figure 67. Unique tap code

ANDEF UNIQUE TAP CODE	_	
	Unique Tap Code	
✓ The Unique Tap Code is enal	led	
Unique Tap Code value cannot be	read.	
	Read Configuration	



*Lock Configuration* user interface can be used to lock blocks of the ST25TN memory. Some lock bits can be set to lock some blocks. Others lock bits can be used to lock the lock bits. This action is non-reversible.

elect a tag : 020D3F	A504E000 (ST2	5TN01K)	ST25TN01K Lock Configuration
Disable lock feature	Lock Block	Block	Locked memory
		03h	СС
		04h	USER MEMORY
		05h	USER MEMORY
		06h	USER MEMORY
	$\checkmark$	07h	USER MEMORY
		08h	USER MEMORY
		09h	USER MEMORY
		0Ah	USER MEMORY
		0Bh	USER MEMORY
		0Ch	USER MEMORY
$\checkmark$		0Dh	USER MEMORY
		0Eh	USER MEMORY
		0Fh	USER MEMORY
	RE	AD CONFIGU	JRATION WRITE CONFIGURATION
			< 1 2 ≻



ST25TN Lock Configu	ration ×					<u> </u>	
Select a tag : 020D3	A504E000 (S	T25TN01K)	• ST	25TN0	)1K	Lock Co	nfiguration
Disable lock feature	Lock Block	Block	Locked memory	Lock E	Block	Block	Locked memory
		10h-11h	USER MEMORY	LOCK	KED	2Dh	PRODUCT IDENTIFICATION
		12h-13h	USER MEMORY			2Eh	ANDEF CONFIGURATION
		14h-15h	USER MEMORY			2Fh	KILL PASSWORD
		16h-17h	USER MEMORY			30h	KILL KEYHOLE
		18h-19h	USER MEMORY			34h-35h	INTERNAL
		1Ah-1Bh	USER MEMORY			36h-37h	INTERNAL
		1Ch-1Dh	USER MEMORY		1	38h-39h	INTERNAL
		1Eh-1Fh	USER MEMORY			3Ah-3Bh	INTERNAL
		20h-21h	USER MEMORY			3Ch-3Dh	ANDEF FIELDS
		22h-23h	USER MEMORY			3Eh-3Fh	ANDEF FIELDS
		24h-25h	USER MEMORY				
		26h-27h	USER MEMORY	1			
		28h-29h	USER MEMORY	1			
		2Ah-2Bh	USER MEMORY	1			
	F	READ CONFIGUE	RATION	WRITE CC	DNFIG	URATION	
			× 1 2	$\left \right>$			
WRITE	CONFIGUR/	ATION : the lock	bits are One-Time-Prog	rammable	e (OTP	). This action	is irreversible.

Figure 69. Lock configuration (second panel)



*Read Configuration* button can be used to read the lock configuration of the selected tag. After selecting features to be locked, click on *Write configuration* button to lock it.

*Memory Configuration* user interface can change the configuration of the memory. This action is non-reversible and can damage the tag.

Figures 70, 71 and 72 display, respectively, the Default, the Extended mode 1 and the Extended mode 2 configurations of the ST25TN.



Figure 70. ST25TN - Default mode configuration



25TN Memory	Configuration 3	×		
Select a tag:				
020D3FA504E0	00 (ST25TN01K)	▼	ST25TN01K MEI	
Default m	ode		T2T Header	
TLVs_Area	size = 160 Bytes		TLVs Area	Selected tag configuration : default mode
TruST25 Sig	gnature available	e		
ANDEF Cus	stomMsg availab	le		
Extended	mode 1			
TLVs_Area	size = 192 Bytes			
TruST25 Sig	gnature not avail	lable		
ANDEF Cus	stomMsg availab	le		
Extended	mode 2			
TLVs_Area	size = 208 Bytes			
TruST25 Sig	gnature not avail	lable	Curtan Area	
ANDEF Cus	stomMsg not ava	ailable	System Area	
	Size in Bytes	Size in Blocks		
T2T Header	16	4		write Conliguration
TLVs Area	192	48	TLVS Area	Change to extended mode 1 is allowed
System Area	48	12	System Area	Please note that this action is irreversible
TOTAL	256	64	System Ared	

Figure 71. ST25TN - Extended mode 1 configuration



25TN Memory	Configuration 3	×		
Select a tag: 020D3FA504E0	00 (ST25TN01K)	•	ST25TN01K MEI	
🔵 Default m	ode		T2T Header	
TLVs_Area	size = 160 Bytes		TLVs Area	Selected tag configuration : default mode
TruST25 Sig	gnature available	e		
ANDEF Cus	stomMsg availab	le		
Extended	mode 1			
TLVs_Area	size = 192 Bytes			
TruST25 Sig	gnature not avai	lable		
ANDEF Cus	stomMsg availab	le		
Extended	mode 2			
TLVs_Area	size = 208 Bytes			
TruST25 Sig	gnature not avai	lable		
ANDEF Cus	stomMsg not ava	ailable	System Area	
	Size in Bytes	Size in Blocks		
T2T Header	16	4		Write Configuration
TLVs Area	208	52	TLVs Area	Change to extended mode 2 is allowed
System Area	32	8		Please note that this action is irreversible
TOTAL	256	64		

Figure 72. ST25TN - Extended mode 2 configuration

*Write configuration* button allows the user to switch the tag from Default to Extended mode 1 or 2 versions, or from Extended mode 1 to extended mode 2 version. No revert action is possible.



# 5.5 ISO 14443-A / Type 4A menu

ISO 14443-A / Type 4A menu can be divided in two parts, as shown in Figure 73:

- 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.

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#### Figure 73. ISO 14443-A / Type 4A menu

#### 5.5.1 Generic features

*System File Editor* menu displays a user interface useful to manage the system file of Type 4A STMicroelectronics tags (see *Figure 74*).

System File	Editor ×				
Select a tao:	02A200129D9F	E9 (ST25TA02K-P)	•		ST TYPE4 SYSTEM FILE
				Description	
	Offset	Name	Value		
	0x0000	System file length	0012		
	0x0002	GPO	50		
	0x0003	Event counter	00		
	0x0004	Counter	000000	_	
	0x0007	Version	13	_	
	0x0008	UID	02 A2 00 12 9D 9F E9		
	0x000F	Memory size	00FF		
	0x0011	Product code	A2		
		READ SYSTI	EM FILE		

Figure 74. 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 a user interface useful to manage the Capacity Container File of any Type 4A tag (see *Figure 75*).

Type4 CC File	e ×	<b>v</b> ,.		
Select a tag:	02A200129D9F	ТҮР E9 (ST25TA02K-P) 🔻	E4 CAPACITY CON	
	Offset	Meaning	Value	]
	0x0000	CCLEN (bytes)	000F	
	0x0002	Mapping Version	20	
	0x0003	MLe (bytes)	00FF	
	0x0005	MLc (bytes)	0036	
	0x0007	T field	04	
	0x0008	L field	06	
	0x0009	Field ID	0001	
	0x000B	Max NDEF file size	0100	
	0x000D	Read access right	00	
	0x000E	Write access right	00	
		READ CC FILE		

Figure 75. 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 76*) displays a 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 76. ISO 14443-A/ Type 4A unitary commands

Part [1] concerns the ISO 14443-A commands. Each command can be sent by clicking on any button. Some fields (such as Select 1, Select 2, Select 3, REQUEST) can be modified with expected data to ensure anti-collision process. Answer column contains the tag answer, if any.

One tag anti-collision sequence button chains 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 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.



# 5.5.2 ST25TA menu

*ST25TA* menu (see *Figure 77*) displays a sub-menu containing all the specific features of the ST25TA series.

ஜ ST2	5PC-NFC					-	×
File	Reader	Tags Demos H	Help				
Туре	UID	NDEF Editor					
		User Memory					
		ISO15693/NFC Typ	be5 🔸				
		ISO14443-A/Type2	2 •		_		
		ISO14443-A/Type4		Type4 CC File			
		ISO14443-B/Type4	1B ▶	System File Editor			
		ISO14443-B ST		Unitary Commands			
		NFC Type3			Access Rights Management		
		PICOPASS	•	M24SR •	GPO features		
					Password Manager		
					Signature		



Access right Management menu displays a user interface useful to manage access right of Type 4A STMicroelectronics tags (see *Figure 78*).

ST Type4 Access Rights management ×	
Select a tag: 02F3000207E69D (ST25TA02KB-D)	ST TYPE 4 ACCESS RIGHTS MANAGEMENT
SELECT NDEF FILE NDEF FILE NUMER 0001	SELECT ACCESS RIGHT ACCESS RIGHT   READ ACCESS  WRITE ACCESS
LOCK WITH PASSWORD ENABLE VERIFICATION REQUIREMENT COMMAND	UNLOCK WITH PASSWORD DISABLE VERIFICATION REQUIREMENT COMMAND
DEFINITELY LOCK NDEF FILE ENABLE PERMANENT STATE COMMAND	CHECK IF A PASSWORD IS REQUIRED         VERIFY COMMAND (LC=00)         Access granted
	Check the tag's CC FILE for read and write access rights DISPLAY CC FILE

Figure 78. Access right Management menu

Lock With Password button can be used to lock the NDEF file of the ST Type4 tag on a read or write features.

Unlock With Password button can be used to remove lock access rights to the NDEF file of the ST Type4 tag on read or write features

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*Definitely Lock NDEF File* button can be used to definitely lock the NDEF file of the ST Type4 tag on a read or write features. Be aware that it is a non-reversible action.

*Check if Passwords is required* button can be used to verify if the NDEF file is locked or available for a read or a write operation.

*GPO feature* menu displays a user interface useful to manage GPO of Type 4A STMicroelectronics tags (see *Figure 79*).

ST Type4A GPO features ×	
Select a tag: 02F3000207E69D (ST25TA02KB-D)	GPO MANAGEMENT
INTERRUPT GPO CONFIGURATION	
SEND INTERRUPT COMMAND	VPULL UP GPO GPO (OPEN DRAIN) OV
STATE CONTROL GPO CONFIGURA	TION
SET GPO COMMAND	VPULL UP GPO ····· GPO (OPEN DRAIN) OV
RESET GPO COMMAND	VPULL UP GPO GPO (OPEN DRAIN) OV
	DISPLAY SYSTEM FILE

Figure 7	79. C	<b>SPO</b>	feature	menu
----------	-------	------------	---------	------

Send Interrupt command, Set GPO command and Reset Interrupt commands button can be used to manage interruptions on GPO pin. GPO must be configured properly to be able to perform this actions. *Display System file* button is a direct access to System File user interface useful to check the configuration of the GPO and change it if needed.

Password Management menu (as described in Figure 5.3.1).

*Signature* menu allows the user to read and verify the TruST25 signature. To activate this feature contact your ST sales office.



# 5.5.3 M24SR menu

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

- Access rights Management menu (as described in Section 5.5.2)
- GPO Features menu (as described in Section 5.5.2)
- Password Management menu (as described in Section 5.3.1)

Figure 80. M24SR series menu

ſ	契 ST25F	PC-NFC				
	File	Reader	Tags Demos	Help		
	Туре	UID	NDEF Editor			
			User Memory			
		No too d	ISO15693/NFC	Type5 🔸		
		NO tag o	ISO14443-A/Ty		System File Editor	
			ISO14443-B		Type4 CC File	
					Unitary Commands	
					ST25TA •	
					M24SR •	Password Manager
	1					

# 5.6 ISO14443-B / Type 4B menu

This menu can be used to display Type 4B CC File user interface, as shown in *Figure 81*.

• Type4 CC File menu (as described in Section 5.3.1)

Figure	81.	ISO14443-B	/ T\	/pe	4B	menu
	• • • •					

ஜ ST25PC-NFC						-	×
File Reader	Tags Demos	Help					
Type UID	NDEF Editor						
	User Memory						
	ISO15693/NFC	Type5 🔸					
	ISO14443-A/Ty	pe2 •					
	ISO14443-A/Ty		Type4 CC File				
	ISO14443-B/Typ	oe4B 🔸	System File Editor				
	ISO14443-B ST		Unitary Commands				
	NFC Type3		ST25TA •				
	PICOPASS			Access Rights Management			
				GPO features			



# 5.7 ISO 14443-B menu

*ISO 14443-B* menu (*Figure 82*) displays a sub-menu containing the specific features of the STMicroelectronics SRi, SRT and ST25TB series.



Figure 82. ISO 14443-B menu



*Specific Commands* menu (*Figure 83*) displays a user interface to manage ISO 14443-B. This tool is helpful to understand and control the ISO 14443-B STMicroelectronics products.

ST25TB/SR Commar	nds ×			
		Slot Number	Chip ID	Action
Anticollision Comma Reset Initiate Pcall16 SlotMarker Command State	nds:	No tag found		
chipID UI	D	State		Extra Commands
		State		Choose a command:
				Select
				Get UID
				Read Block
				Write Block
No tag selected				Send Command Status:

Figure 83. ST25TB user interface


## 5.8 NFC Type 3 menu

*NFC Type 3* menu can be used to display Type 3 attribute informations interface, see *Figure 84*.

*Type3 Attribute Information* menu displays a user interface useful to read and modify the attribute informations of a Type3 tag (see *Figure 85*).



💐 ST25	PC-NFC		-	×
File	Reader	Tags Demos Help		
Туре	UID	NDEF Editor		
		User Memory		
	No tag d	ISO15693/NFC Type5		
	NO tag u	ISO14443-A/Type2		
		ISO14443-A/Type4A 🔸		
		ISO14443-B/Type4B •		
		ISO14443-B ST •		
			Type3 Attribute Information	
		PICOPASS .		

Figure 85. Type3 Attribute Information menu





## 6 Demos menu

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

- ST25DV-I2C menu
- ST25DV-PWM menu

#### Figure 86. Demos menu

ஜ ST2	5PC-NFC				-	)
File	Reader	Tags	Demos	Help		
Туре	UID		ST25DV-	i2C •		
			ST25DV-	PWM ·		

## 6.1 ST25DV-I2C menu

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

- ST25DV-DISCOVERY
- STEVAL-SMARTAG1
- STEVAL-SMARTAG2
- Device configuration



ST25PC-NFC		-	Ш	×				
File Reader Tags De	nos Help	/						
Type UID ST2	5DV-I2C · ST25DV-DISCOVERY ·							
ST2	5DV-PWM · STEVAL-SMARTAG1							
No tag detected	STEVAL-SMARTAG2 Device Configuration •							
Select protocols for anticollision : Sol15693/NFC Type5 ISO14443-A/NFC Type2 & Typ ISO14443-B/NFC Type8 ISO14443-B/NFC Type8 ISO14443-B/NFC Type1 ISO1443-B/NFC Type1 ISO1443-B/NFC Type1 ISO18092/TYPE3	e4A							



#### 6.1.1 ST25DV-DISCOVERY menu

As illustrated by *Figure 88*, two menus are available for ST25DV-DISCOVERY. There are no differences in terms of activities, but the firmware and the FTM protocol are different.



Figure 88. ST25DV-DISCOVERY menu

The user interface contains all FTM demonstrations (*Firmware Upgrade*, *Send picture*, *Receive picture*, *Send random data*, *Send file*, *Receive data*, *Stop watch*) in the single user interface.

*FTM demos* implements an integrated, optimized and easy-to-use FTM protocol. All tasks parameters are managed by the SDK.

The demonstrations must be run with the new generation of ST25DV-DISCOVERY based on MB1396 board and firmware version equal or upper than 2.1.0), or the last generation of ST25DV-DISCOVERY based on MB1283 board with firmware version equal or upper than 1.2.0.

Legacy demonstrations user interface contains the same demonstrations as FTM, based on simple SDK commands. Global management of the task is carried out by the PC software and is not optimized. This demonstrations have to be used with the old generation of ST25DV-DISCOVERY based on MB1283 boards with firmware version lower than 1.2.0.

It is recommended to use the FTM demos using new integrated FTM protocol. Be aware that the firmware of your ST25DV-DISCOVERY (based on MB1283 board) can be updated with a new firmware version with upper revision.



		ST25DV-DIS	COVERY -	FTM demos
1. Select a targe	t:	2. Select a demo :		Check board version
E0022700	04302A09 (ST25DV64K-J)	•	1	Firmware Upgrade
			:	Send a picture
			1	Receive a picture
			:	Send a 100k-byte random buffer
			1	Send a file
			1	Receive a buffer in a file
				Stop watch demo
4. Select an acti	on:			
4. Select an acti	on: Start	Stop	Pause	Resume

FTM demos contains all demonstrations available for your ST25DV-DISCOVERY.

Select the demonstration to be played:

- Check board version
- Firmware Upgrade
- Send a Picture
- Receive a picture
- Send a 100k-byte random buffer
- Send a file
- Receive a buffer in a file
- Stop watch

*Check board version* demonstration allows the user to check the firmware version of ST25DV-DISCOVERY, displaying the version number. If the firmware is not compatible with *FTM demos* menu, no version number is displayed.



25DV-I2C Picture Transfer ×			
	ST25DV-DISC	OVERY -	FTM demos
I. Select a target :	2. Select a demo :		Check board version
E0022500052F8AC7 (ST25DV04K-J)	<b>•</b>	F	Firmware Upgrade
		5	Send a picture
		F	Receive a picture
		5	Send a 100k-byte random buffer
		5	Send a file
		F	Receive a buffer in a file
		5	Stop watch demo
Discover ST25DV	Fast Transfer Ready to sta demo!!	Demo Ir t	
Start	Stop	Pause	Resume
Picture:	Transfer progress:		Transfer time: 00:00:20 Board=0.1.2.0

Figure 90. Check board version

*Firmware Upgrade*, *Send a Picture*, *Send a 100k-byte random buffer* and *Send a file* demonstrate the transfer of data from the RF reader to the ST25DV-DISCOVERY using the ST25DV-I2C Fast Transfer Mode mailbox (FTM feature).

In case of *Firmware Upgrade*, the ST25DV-DISCOVERY reboots automatically with an updated firmware revision. For *Send a Picture*, the selected picture is displayed on ST25DV-DISCOVERY. *Send a 100k-byte random buffer* and *Send a file* are used as example of optimized transfer of data.



ST25DV-I2C Picture Transfer ×			
	ST25DV-DISCOVER	Y - FTM demos	
1. Select a target :	2. Select a demo :	Check board version	
E0022500052F8AC7 (ST25DV0	🐝 Select JPG File		×
	$\leftarrow$ $\rightarrow$ $\checkmark$ $\uparrow$ $\blacksquare$ $<$ images	~	ර Search images
	Organize   New folder		📰 🔹 🔟 💡
3. Prepare the Discovery Kit firmwa Discover ST25DV	Desktop	ateau.jpg OIT.jpg	© ST.jpg ⊙ Tiger.jpg
	File name: Tiger.jpg		V Jpg Files (*,jpg) V Open Cancel
4. Select an action:			
Start	Stop Pause	Resume	
Picture:	Transfer progress:	Transfer time:	

Figure 91. Send a file



	i igure 52. Seria a pi	
ST25DV-I2C Picture Transfer ×		
	ST25DV-DISCOV	VERY - FTM demos
1. Select a target :	2. Select a demo :	Check board version
E0022500052F8AC7 (ST250	0V04K-J) ▼	Firmware Upgrade
		Send a picture
		Receive a picture
		Send a 100k-byte random buffer
		Send a file
		Receive a buffer in a file
		Stop watch demo
3. Prepare the Discovery Kit firm Discover ST25DV	F Ready to start demo!!	
4. Select an action:		
Start	Stop P	'ause Resume
Picture:	Transfer progress:	Transfer time: 00:00:20 Board=0.1.2.0

. .

Receive a picture and Receive a buffer in a file demonstrate the transfer of data from the ST25DV-DISCOVERY to the RF reader using the ST25DV-I2C Fast Transfer Mode mailbox (FTM feature).

Receive a buffer in a file is used as an example of optimized transfer of data. Receive picture transfers the selected picture, displayed on the PC user interface.



	9	
ST25DV-I2C Picture Transfer ×		
	ST25DV-DISCOVER	Y - FTM demos
1. Select a target :	2. Select a demo :	Check board version
E0022500052F8AC7 (ST25DV04K-J)	•	Firmware Upgrade
		Send a picture
		Receive a picture
		Send a 100k-byte random buffer
		Send a file
		Receive a buffer in a file
		Stop watch demo
4. Select an action:	Ready to start demo!!	Select Picture
Start Picture:	Stop Pause Transfer progress:	Resume Transfer time: 00:06:16

Figure 93. Receive a picture



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*Stop watch* displays a user interface to demonstrate the clock synchronization using the ST25DV-I2C Fast Transfer Mode mailbox (FTM). Use STOP, PAUSE and RESUME buttons to interact with the demonstration.

ST25DV-I2C Picture Transfer ×	
ST25DV-E	DISCOVERY - FTM demos
1. Select a target : 2. Select a den	no : Check board version
E0022500052F8AC7 (ST25DV04K-J)	Firmware Upgrade
	Send a picture
	Receive a picture
	Send a 100k-byte random buffer
Not addr	essed commands) Send a file
_	Receive a buffer in a file
	Stop watch demo
4. select an action:	o start bil
Start Stop	Pause Resume
Picture: Transfer progress.	Transfer time: 00:02:20

Figure 94. Stop watch



## 6.1.2 STEVAL-SMARTAG1 menu

*STEVAL-SMARTAG1* menu displays a user interface to play with the STEVAL-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.

NFCSensorTAG demo × Select a NFCSensorTAG : 02A200129D9FE9 (ST25TA02K-P)	
CONFIGURA	ATION
Sampling options Sampling interval(s) : 5 sec I log only out of range [min,max] and accelerometer events Force logging of one sample	Firmware version : Note : change of settings will erase saved samples
Sensors to monitor Temperature Enable	Humidity Enable
Pressure Enable	Acceleration Enable
READ CONFIGURATION	UPDATE CONFIGURATION

Figure 95. NFC sensor tag demonstration



#### 6.1.3 STEVAL-SMARTAG2 menu

*STEVAL-SMARTAG2* menu displays a user interface to play with the STEVAL-SMARTAG2 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.







# 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 97. ST25DV-PWM Demos menu

ஜ ST2	5PC-NFC									-	×
File	Reader	Tags	Demos	Help							
Туре	UID		ST25DV-I	2C •							
			ST25DV-I	PWM →	ST25DV-PWM-eSET · PWI	M Settings					
						_					

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



Figure 98. ST25DV-PWM demonstration



# 7 Revision history

Date	Revision	Changes
13-Sep-2018	1	Initial release.
17-Sep-2019	2	<ul> <li>Updated Section 2: Features, Section 2.1: Supported readers, Section 3.1: Download, Section 4: GUI overview, Section 4.2: Inventory panel, Section 4.2.1: Tag info panel, Section 4.2.2: Tag contextual menu, Section 4.3: Main menu, Section 4.3.4: Demos menu, Section 4.3.5: Help menu, Section 5.1: NDEF editor, Section 5.2: User memory, Section 5.3.1: Generic features, Section 5.2: ST25DV-I2C menu, Section 5.3.6: M24LR menu, Section 5.5.1: Generic features, Section 5.5.2: ST25TA menu and Section 5.5.3: M24SR menu.</li> <li>Updated Figure 1: Tag contextual menu, Figure 2: Get software, Figure 6: ST25PC-NFC main window, Figure 6: ST25PC-NFC main window, Figure 7: ST25R3911B-DISCO RF reader detected, Figure 8: No RF reader detected, Figure 9: No RF reader detected, Figure 10: Inventory panel, Figure 11: Detected tags with tool-tip, Figure 12: Tag info panel, Figure 13: Contextual menu, Figure 17: Reader menu, Figure 19: Access ST25DV-I2C features from the Main menu bar, Figure 20: Demonstrations associated with the ST25DV-DISCOVERY board, Figure 21: Help menu, Figure 23: Web resources menu, Figure 30: Tag operation, Figure 36: Password management, Figure 35: Type 5 CC File, Figure 38: ISO 15693 unitary commands, Figure 35: Type 5 CC File, Figure 38: ISO 15693 unitary commands, Figure 35: Type 5 CC File, Figure 42: Fast transfer mode, Figure 41: ST25DV-I2C multi-area configuration, Figure 43: ST25DV-PWM menu, Figure 44: PWM settings, Figure 46: ST25TV Tourner, Figure 48: ST25TV Kill command, Figure 59: M24LR menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: M24SR series menu, Figure 82: ISO 14443-B menu, Figure 80: Demos menu, Figure 87:</li></ul>
		Updated Introduction, Section 2: Features, Section 5.3.2: ST25DV-I2C menu, Section 5.3.3: ST25DV-PWM menu and Section 5.3.4: ST25TV
20lan-2021	3	menu and added Section 5.3.5: ST25TVC menu. Removed former Section 3.3: Upgrading for TruST25 features.
20-0011-202 I	5	Updated Figure 19: Access ST25DV-I2C features from the Main menu bar, Figure 24: About menu, Figure 32: ISO 15693 / NFC Type 5 menu, Figure 39: ST25DV-I2C menu, Figure 43: ST25DV-PWM menu, Figure 45: ST25TV menu and Figure 59: M24LR menu.

#### Table 2. Document revision history



Date	Revision	Changes
07-Sep-2021	4	Updated Section 2: Features, Section 5.4: ISO14443-A / Type 2 menu and its subsections, and Section 6.1.1: ST25DV-DISCOVERY menu and its figures. Updated Table 1: Applicable products. Updated Figure 2: Get software, Figure 20: Demonstrations associated with the ST25DV-DISCOVERY board, Figure 23: Web resources menu and Figure 87: ST25DV-I2C menu. Minor text edits across the whole document.
18-Dec-2024	5	Updated Section 2: Features, Section 2.1: Supported readers, Section 3.2: Running the installer, and Section 6.1: ST25DV-I2C menu. Added Section 6.1.3: STEVAL-SMARTAG2 menu. Updated Figure 8: No RF reader detected and Figure 88: ST25DV- DISCOVERY menu.



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