

# **Software User Manual**

## **HF Reader Testing Demo**

(ISO14443A/B,MIFARE DESFire,ISO15693)

(Version 1.1)

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## 1. Introduction

This testing demo is offered for the basic functions available to operate read/write and other functions of the HF series Modules and Reader products designed by CHIKEK, and it supports of UART-TTL, RS232, RS485 and USB(COM) port products.

This demo is programmed basing on C# language and run under WINDOWS system.

Any other specific function not showing in this demo, can be realized by customize if there need, please contact our sales persons for details requesting.

## 2. Operation Features

### 2.1 Hardware connection

For Modules series product, please firstly refer to datasheet of the specified Module using for their PIN definition and connect them with correspond mid-ware tool when testing with PC.

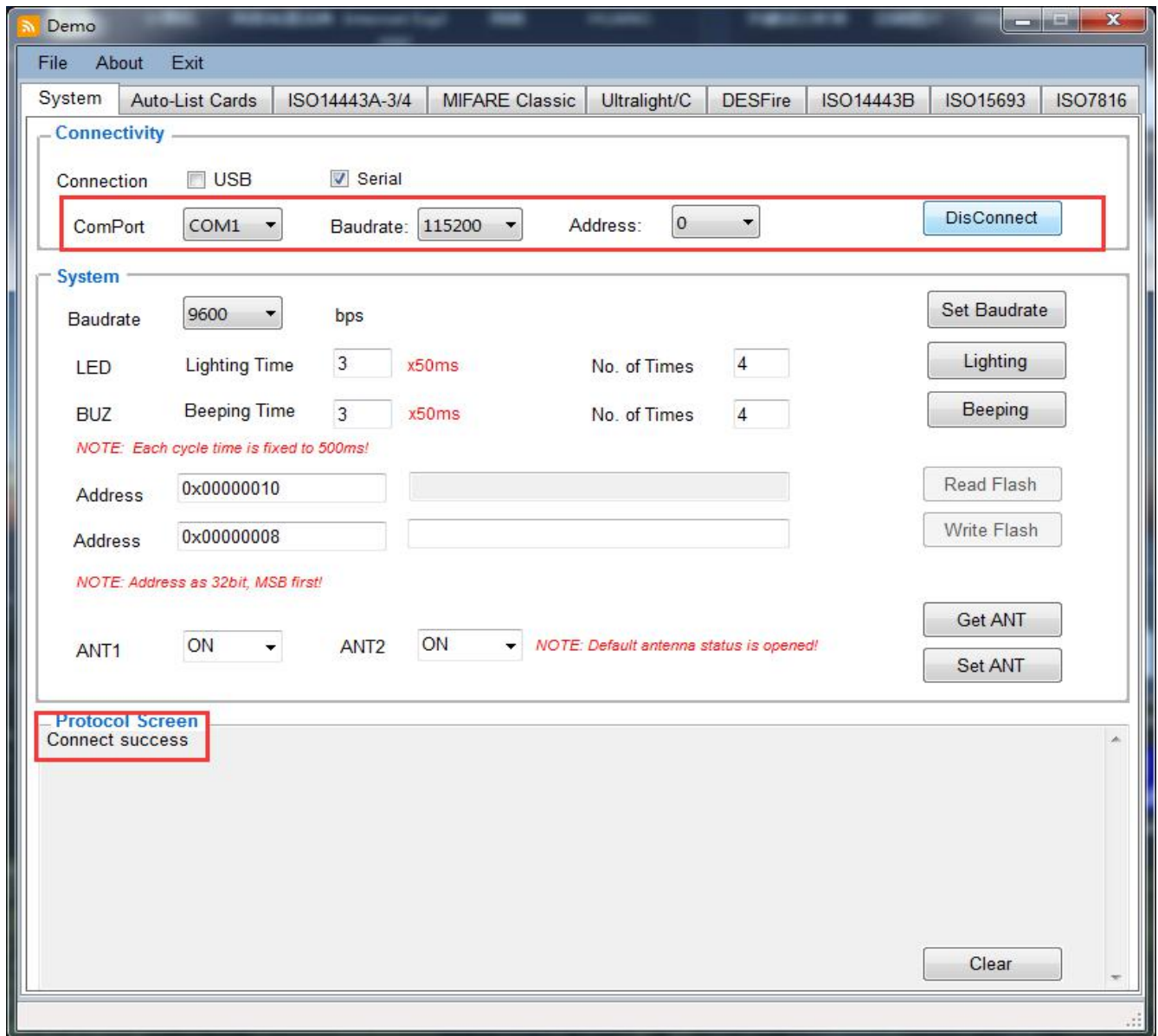
For Reader product with USB COM port, just plug USB connector to the PC side.

Then please check the COM port if be recognized in PC successfully, the way to check it is: Open Computer Manager--Device Manager--COM and LPT, as below :



## 2.2 Software connection

Firstly double click the DEMO EXE file to open demo software, and enter into connection interface as below:



Notes for Connectivity parameters:

Port number: Refer to Device Manager--COM&LPT, which on listing  
 Baudrate: Default as 115200bps, available from 9600bps ~ 115200bps;  
 Address: Not important

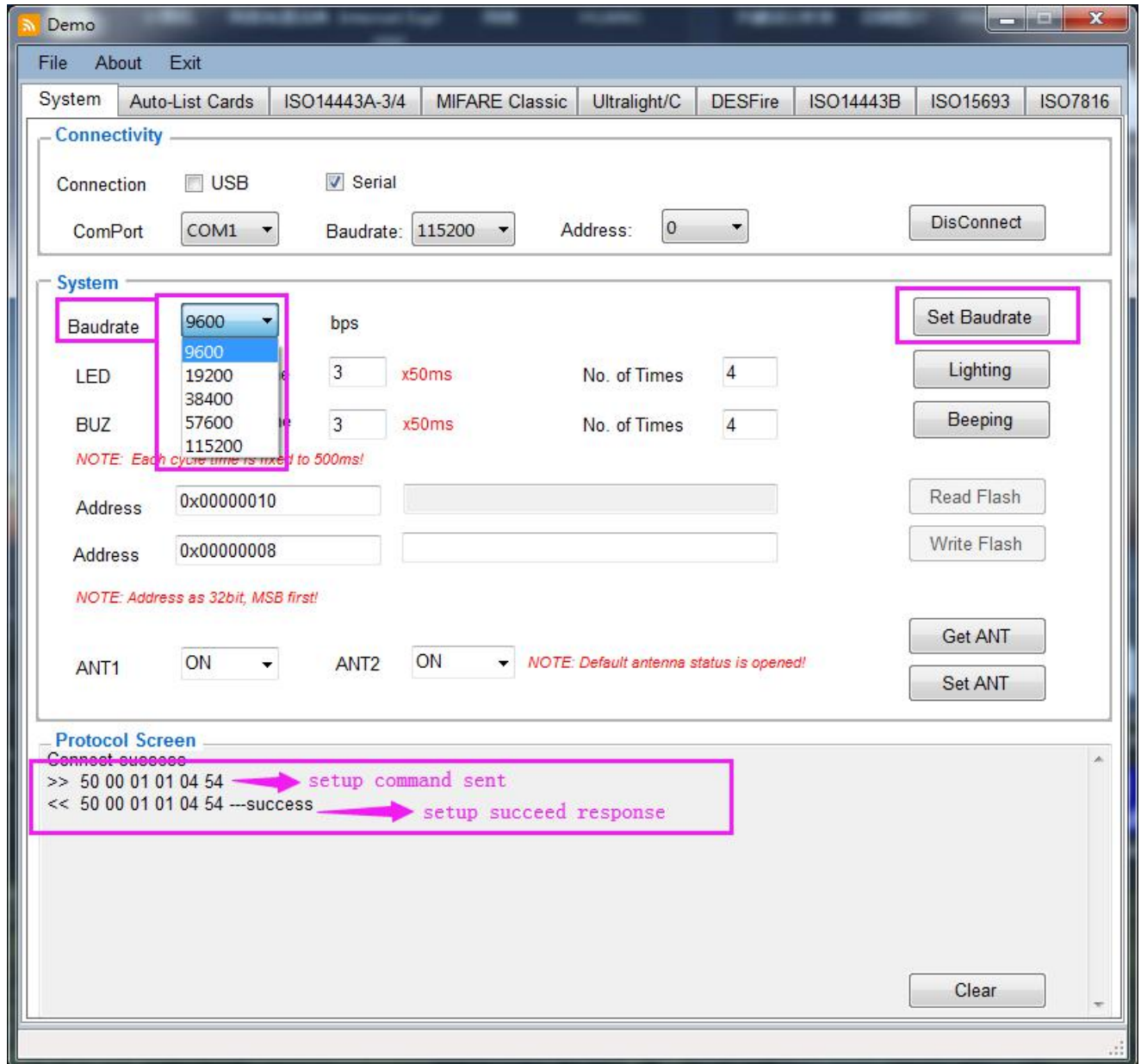
Make sure above parameters in right, then click Connect button to enter functions interface, and according response will be shown on "Protocol Screen" box.

## 2.3 System command

### 2.3.1 Set Baudrate

This function is to set according baudrate to be used in specific application. The available value is as listing and just select the right one to be set, as following show.

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.



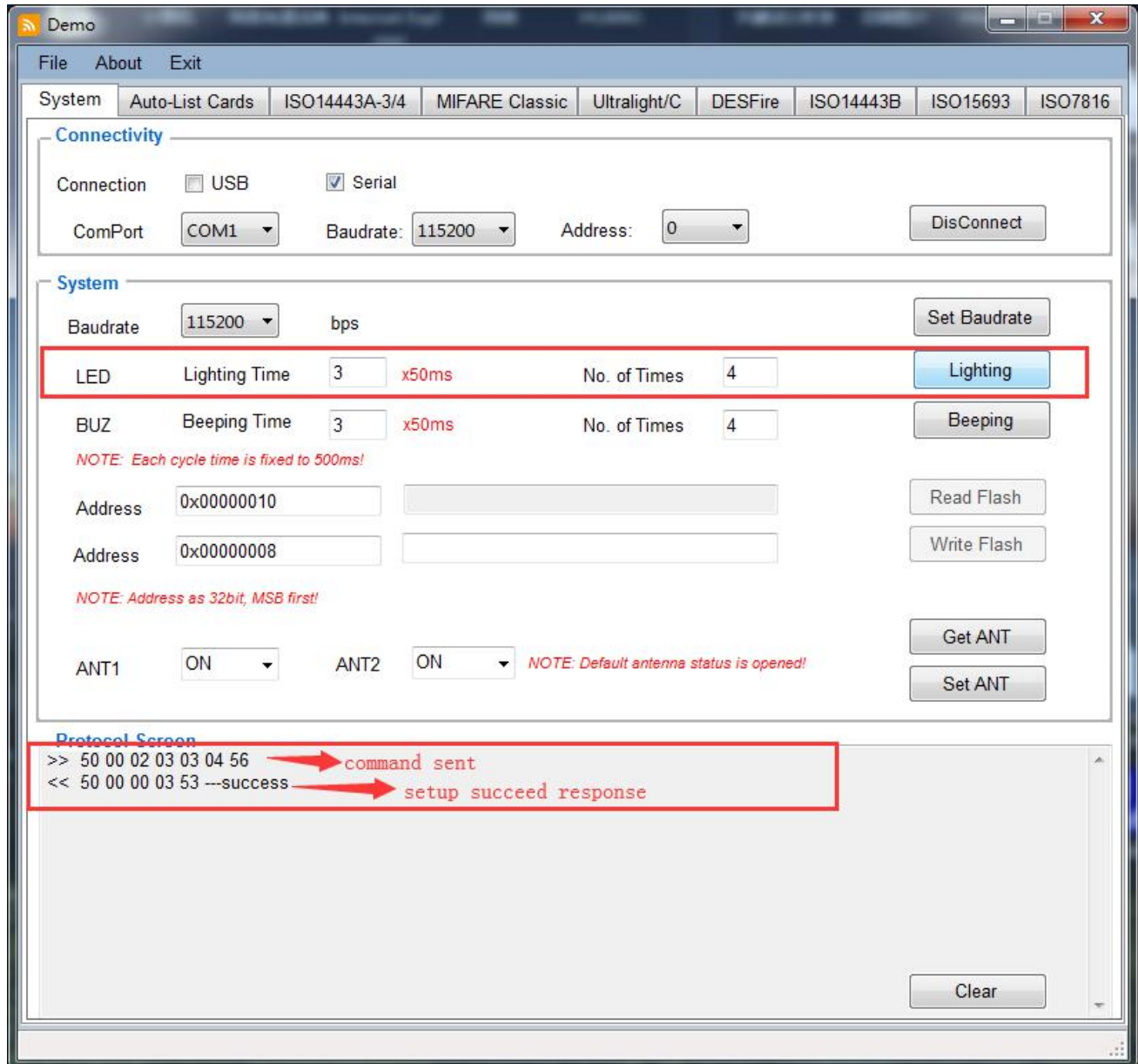
### 2.3.2 Set LED

This function is to set according LED's working way to be used in specific application. The available value including:

**Lighting time:** time length to be light, and the unit as 50ms

**No. Of Times:** time cycle, which means how many times to be light during whole length

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.



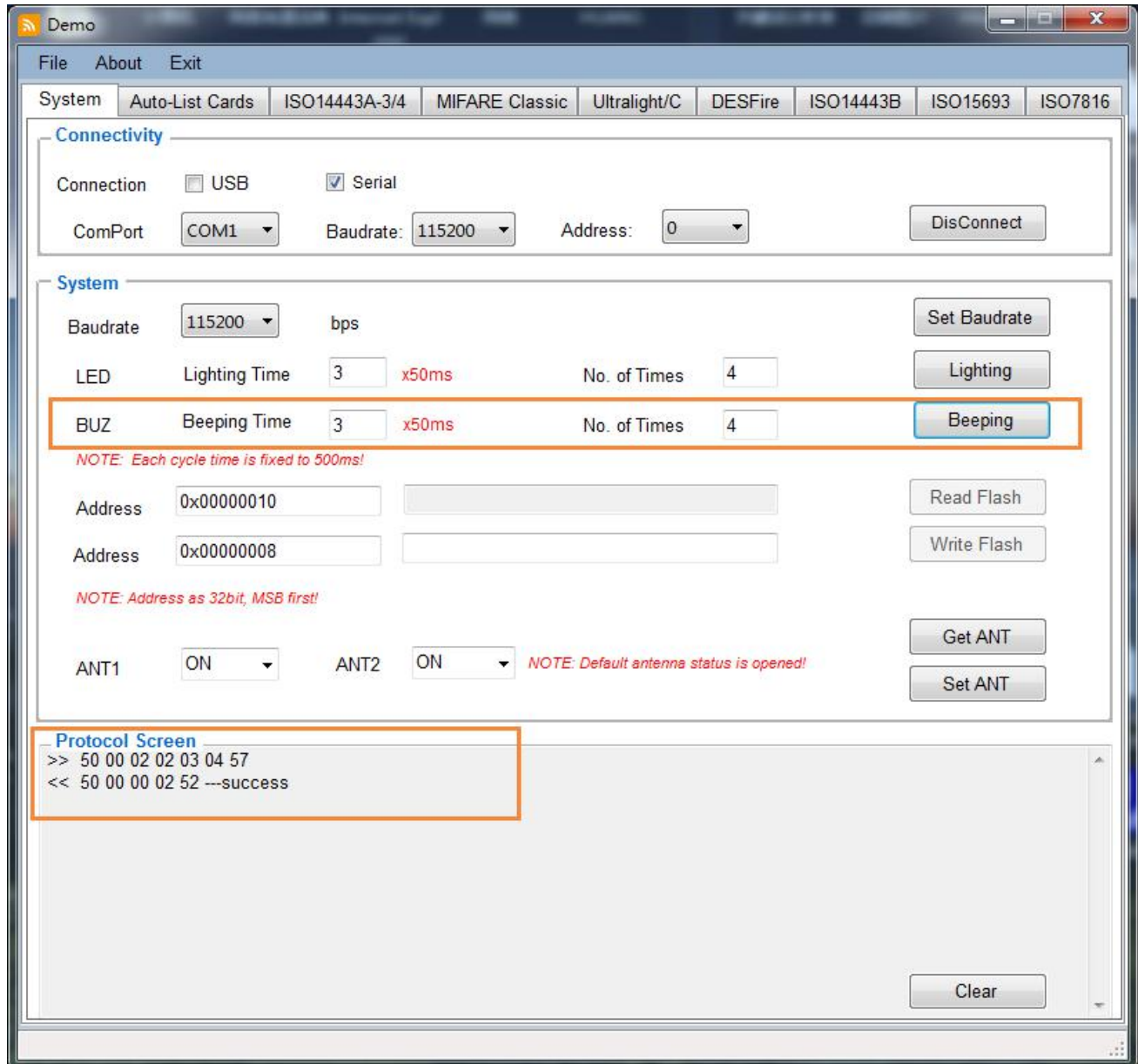
### 2.3.3 Set BUZ

This function is to set according buzzer's working way to be used in specific application. The available value including:

**Beeping time:** time length to be beeping, and the unit as 50ms

**No. Of Times:** time cycle, which means how many times to be beeping during whole length

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.



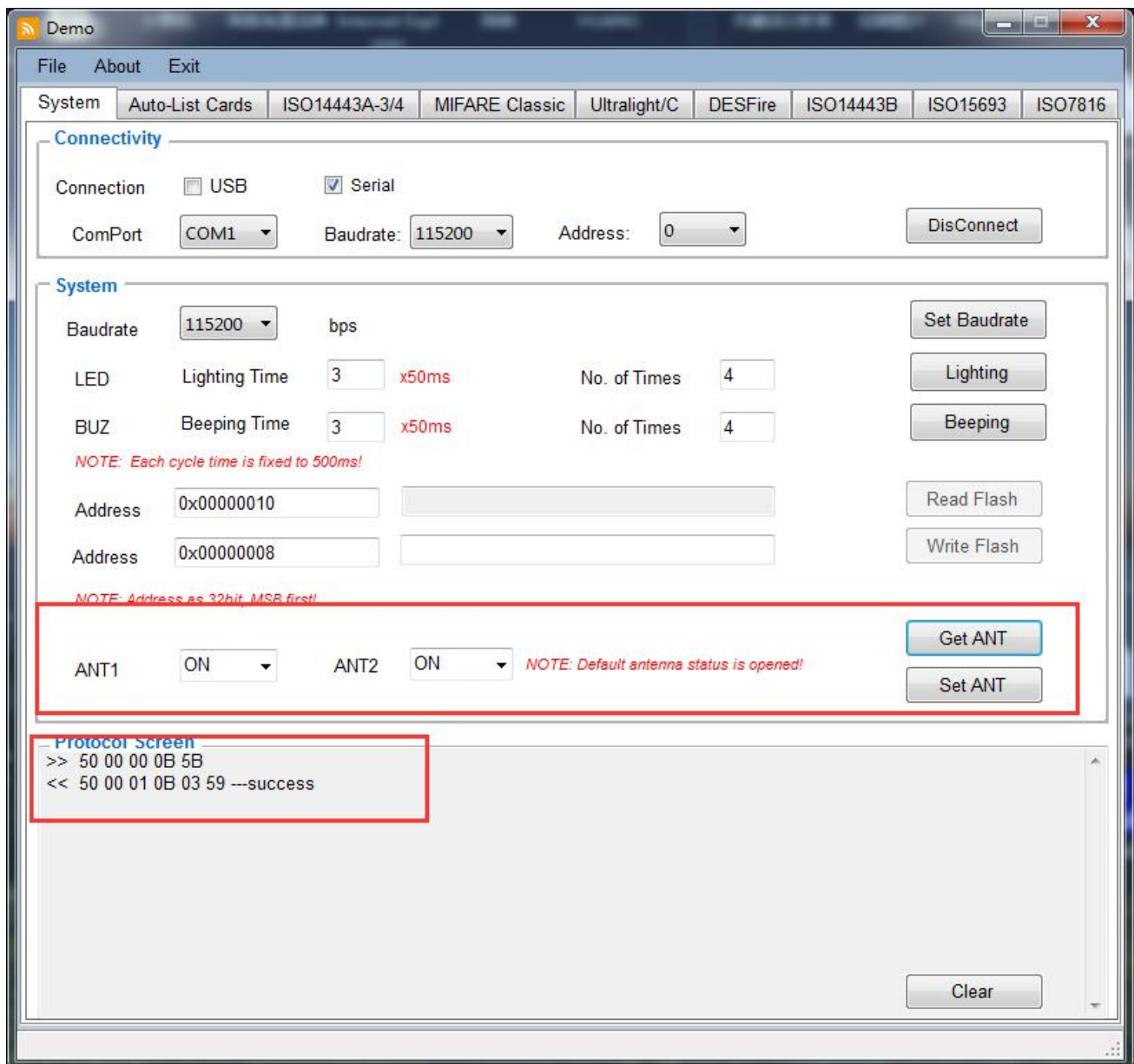


### 2.3.4 Set ANT

This function is to set which antenna to be ON or OFF when there are two antennas.

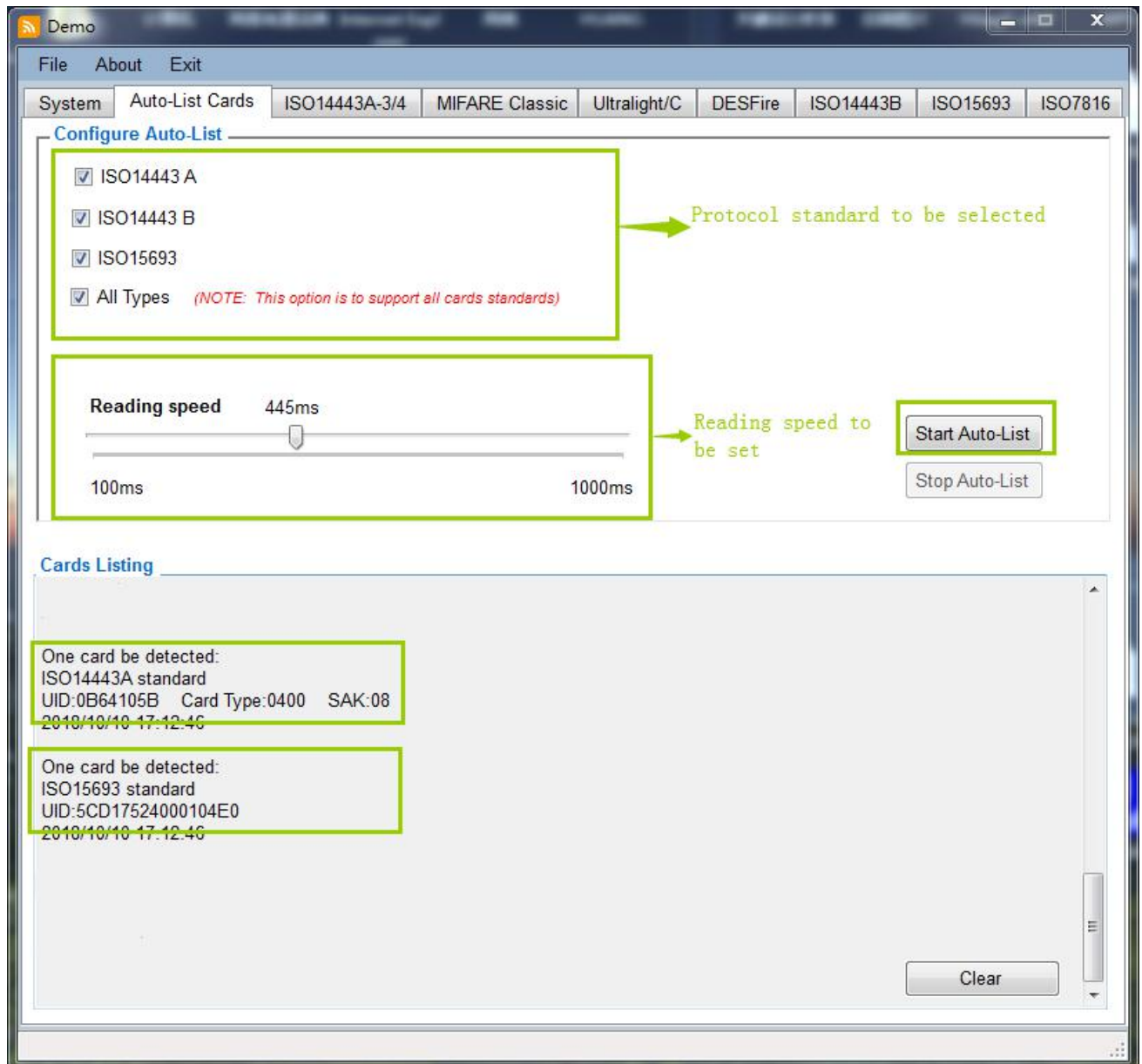
*(Note: The antenna's default status is opened, and please refer to detail commands to do setup based on the Communication Protocol document for different product, or contact our technician for support)*

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.



## 2.4 Auto-List Card

This TAB is available to do Read all cards under 13.56MHz frequency automatically, and the function can be configured Protocol standard and Reading speed as following shown, the cards information will be listing on Card Listing box:



## 2.5 ISO14443A-3/4

The interface is to enable ISO14443A-3 standard cards to enter into ISO14443A-4 standard and as a contactless CPU card.

### 2.5.1 Request card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

The screenshot displays the 'Demo' application window with the 'ISO14443A-3/4' tab selected. The 'Card Info' section contains the following fields:

- Tag Type: 4400
- SAK: 20
- UID number: 04461F7A662180

To the right of these fields are two buttons: 'Active-IDLE' and 'Active-ALL'. Below the 'Card Info' section is the 'ISO14443A-4' section, which includes three input fields with the values '0084000008', '0A000084000008', and '0A000084000008'. To the right of these fields are three buttons: 'Send RATS', 'Send APDU', and 'APDU Channel'. At the bottom of the window is the 'Protocol Screen' section, which shows the following protocol data:

```
>> 50 00 02 22 10 26 46
<< 50 00 0B 22 44 00 20 07 04 46 1F 7A 66 21 80 FA ---success
```

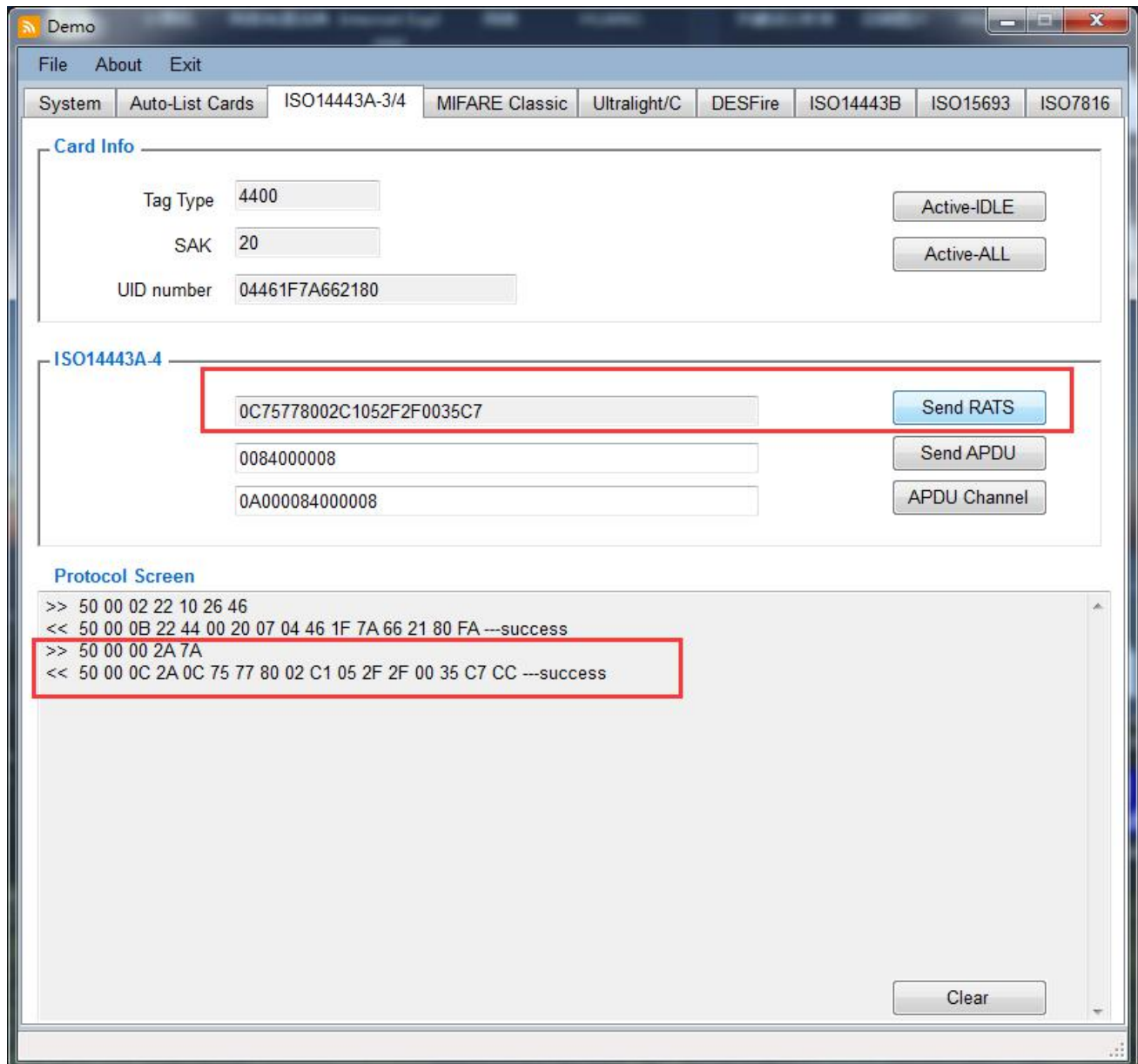
A 'Clear' button is located at the bottom right of the 'Protocol Screen' section.

## 2.5.2 Send RATS

RATS= Request for Answer to Select

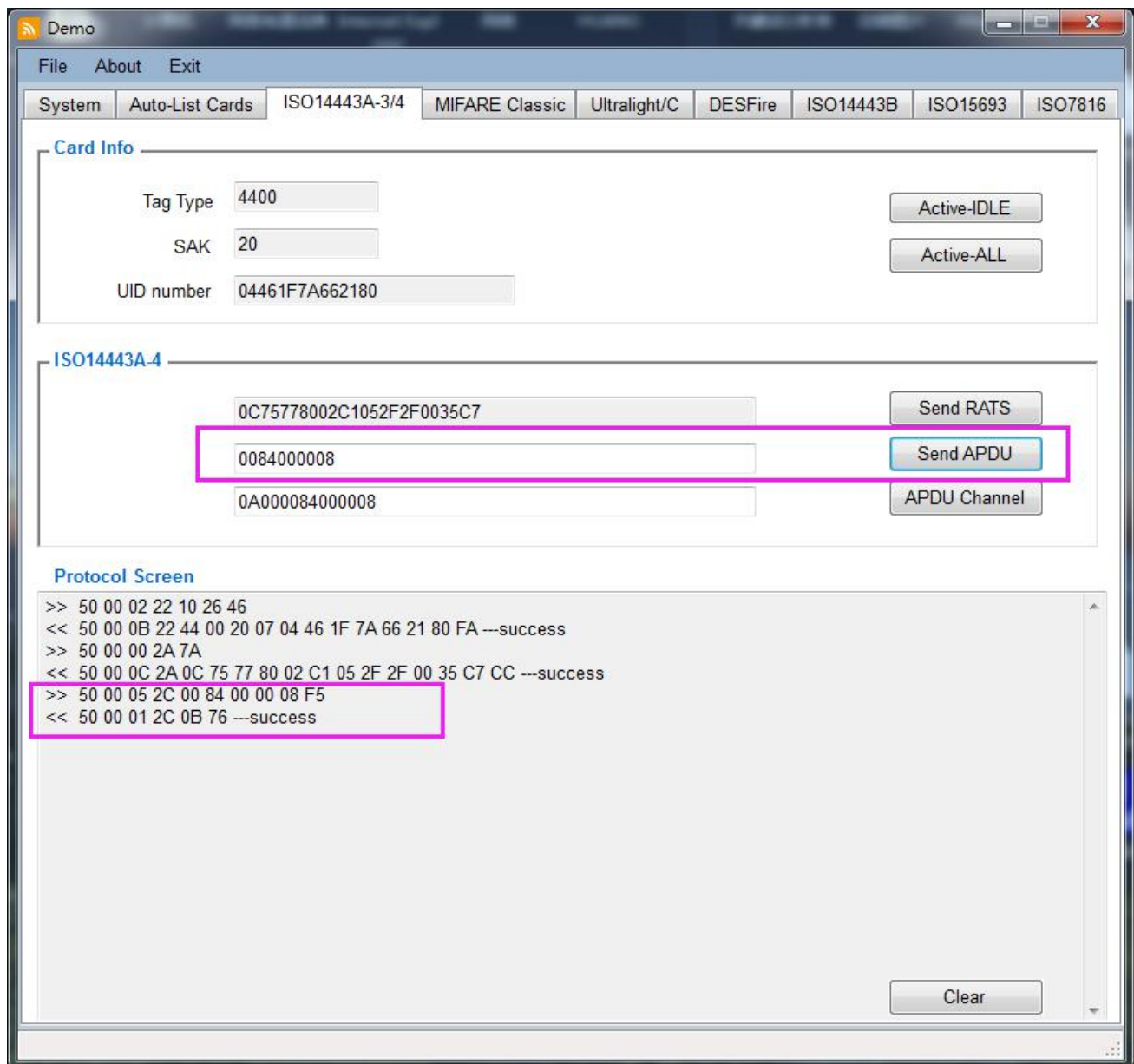
This function is to make the card quit from ISO14443A-3 enter into 14443A-4 standard, and the data returned after Send RATS, it includes the information of the testing card's.

And the response to RATS is the "Answer to Select" ATS, and the ATS consists of specified bytes for communicate between PICC capabilities and PCD. Details specific byte's meaning, please refer to datasheet of using card.



### 2.5.3 Send APDU

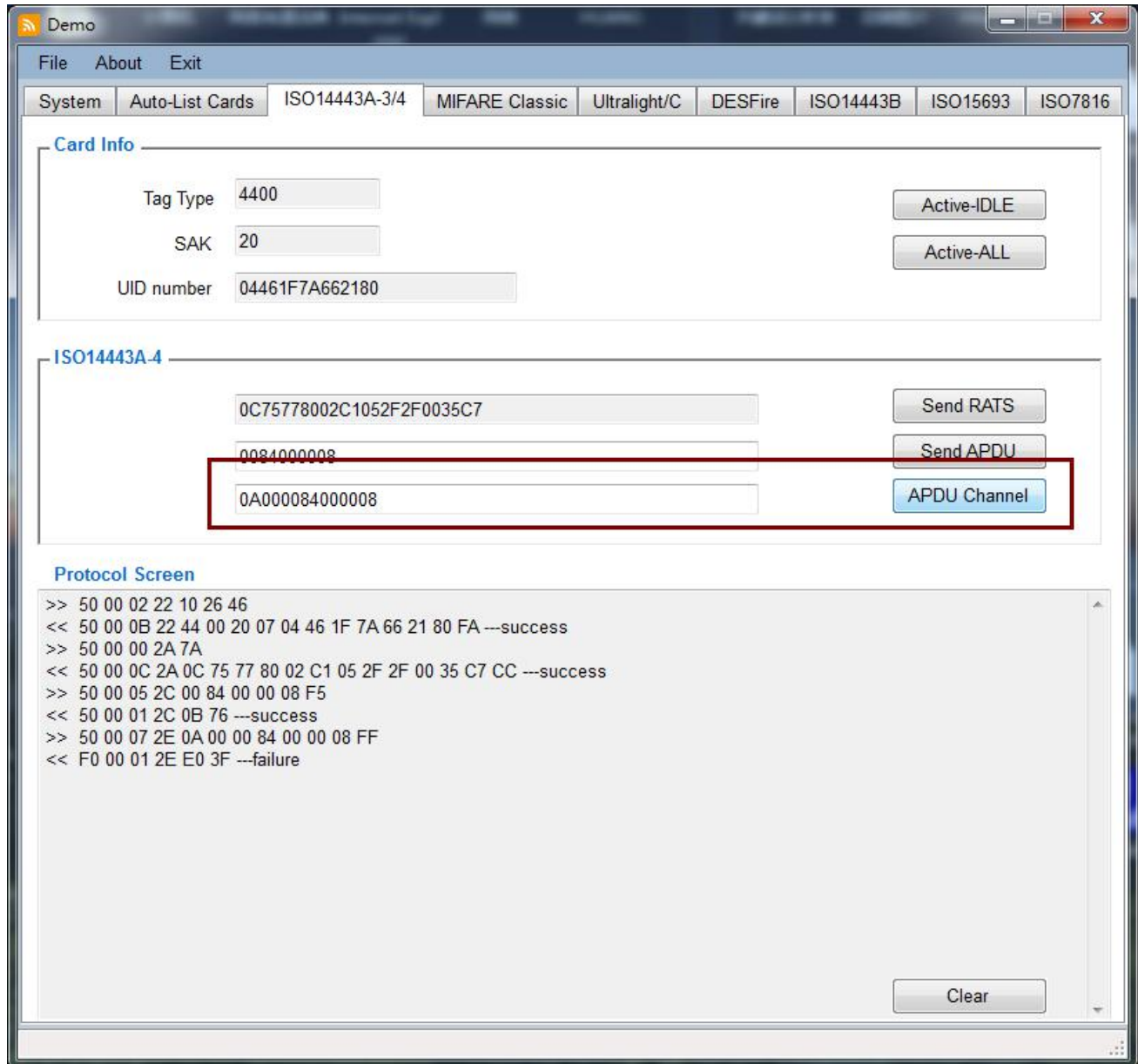
This function button is a channel opened for the APDU commands, which according to different compatible commands for different cards, and please refer to them based on the cards' datasheet.



### 2.5.4 APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands please refer to ISO14443A-4 Standard .



## 2.6 MIFARE Classic

This Interface is opened all available data operations specially for the MIFARE Classic series cards, including card type of MIFARE Classic 1K, MIFARE Classic 4K, etc,

The function is enable to get card details information, read and write block data, key authenticate, also the E-wallet, etc.



### 2.6.1 MIFARE Classic- Request card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

When succeeded request card, the card's details information including card type, SAK, UID number, memory sizes, etc will be shown as below:

The screenshot displays the 'Demo' application window with the 'MIFARE Classic' tab selected. The interface is divided into several sections:

- Card Info:** A red box highlights the following fields: Tag Type (0400), SAK (08), UID number (0B64105B), Memory Size (1 k), Block Size (16 Bytes), Number of Blocks (64 Blocks), and Number of Sectors (16 Sectors). Below these is the APDU field with the value 0A000084000008.
- Active Buttons:** A red box highlights two buttons: 'Active-IDLE' and 'Active-ALL'. Below them is the 'APDU Channel' button.
- MIFARE 1K&4K:** This section contains a 'Card UID' field with the value 0B64105B (highlighted with a red box). Below it are fields for 'Block Addr' (5), 'Key Type' (KEYA), and 'Key' (FFFFFFFF). To the right are buttons for 'Authenticate', 'Read Block', 'Write Block', 'Read All Blocks', and 'E-Wallet'.
- Protocol Screen:** A red box highlights the protocol log showing the following data: >> 50 00 02 22 10 26 46 and << 50 00 08 22 04 00 08 04 0B 64 10 5B 56 ---success. A 'Clear' button is located at the bottom right of this section.

A note at the bottom of the 'MIFARE 1K&4K' section states: *NOTE: Except for the function "Read All Block", all commands must Authenticate Firstly !*

## 2.6.2 MIFARE Classic-APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands please refer to ISO14443A-3 Standard .

The screenshot shows a software window titled "Demo" with a menu bar (File, About, Exit) and a tabbed interface. The "MIFARE Classic" tab is selected. The "Card Info" section contains fields for Tag Type (SAK), UID number, Memory Size, Block Size, Number of Blocks, and Number of Sectors. To the right of these fields are buttons for "Active-IDLE", "Active-ALL", and "APDU Channel". The "APDU" field is highlighted with a red box and contains the value "0A000084000008". Below this is the "MIFARE 1K&4K" section, which includes fields for Card UID, BlockAddr (set to 5), Key Type (KEYA), and Key (FFFFFFFFFFFF). To the right of these fields are buttons for "Authenticate", "Read Block", "Write Block", "Read All Blocks", and "E-Wallet". A note at the bottom of this section states: "NOTE: Except for the function 'Read All Block', all commands must Authenticate Firstly!". The "Protocol Screen" section at the bottom is a large text area with a "Clear" button.

Demo

File About Exit

System Auto-List Cards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire ISO14443B ISO15693 ISO7816

**Card Info**

Tag Type SAK

UID number

Memory Size

Block Size

Number of Blocks

Number of Sectors

APDU 0A000084000008

Active-IDLE

Active-ALL

APDU Channel

**MIFARE 1K&4K**

Card UID

BlockAddr 5 Key Type KEYA Key FFFFFFFFFFFFFF

Authenticate

Read Block

Write Block

Read All Blocks

E-Wallet

*NOTE: Except for the function "Read All Block", all commands must Authenticate Firstly !*

**Protocol Screen**

Clear



### 2.6.3 MIFARE Classic- Key Authenticate

This is to use according KEY to authenticate for any specific Block address, Key Type and Key value. Please select the according parameter need to be used.

The screenshot shows the 'Demo' application window with the 'MIFARE Classic' tab selected. The 'Card Info' section displays details for a MIFARE Classic 1K/4K card, including Tag Type (0400), SAK (08), UID number (0B64105B), Memory Size (1 k), Block Size (16 Bytes), Number of Blocks (64 Blocks), Number of Sectors (16 Sectors), and APDU (0A000084000008). The 'MIFARE 1K&4K' section shows the Card UID (0B64105B) and the authentication settings: Block Addr (5), Key Type (KEYA), and Key (FFFFFFFFFFFF). The 'Authenticate' button is highlighted with a red box. Below the authentication settings are buttons for 'Read Block', 'Write Block', 'Read All Blocks', and 'E-Wallet'. A note states: 'NOTE: Except for the function "Read All Block", all commands must Authenticate Firstly!'. The 'Protocol Screen' section shows a list of commands and responses, with the last two lines highlighted by a red box: '>> 50 00 0C 16 60 05 0B 64 10 5B FF FF FF FF FF FF 0B' and '<< 50 00 00 16 46 ---success'. A 'Clear' button is located at the bottom right of the protocol screen.

**Note:**

1. The default Key value for a new MIFARE Classic 1K/4K card is FFFFFFFFFFFFFF when there is no change of it
2. Before each authenticate, it must to do Active card firstly and make sure without any remove card from antenna field.

## 2.6.4 MIFARE Classic-Read Block

To get to read out the data stored in the according block address.

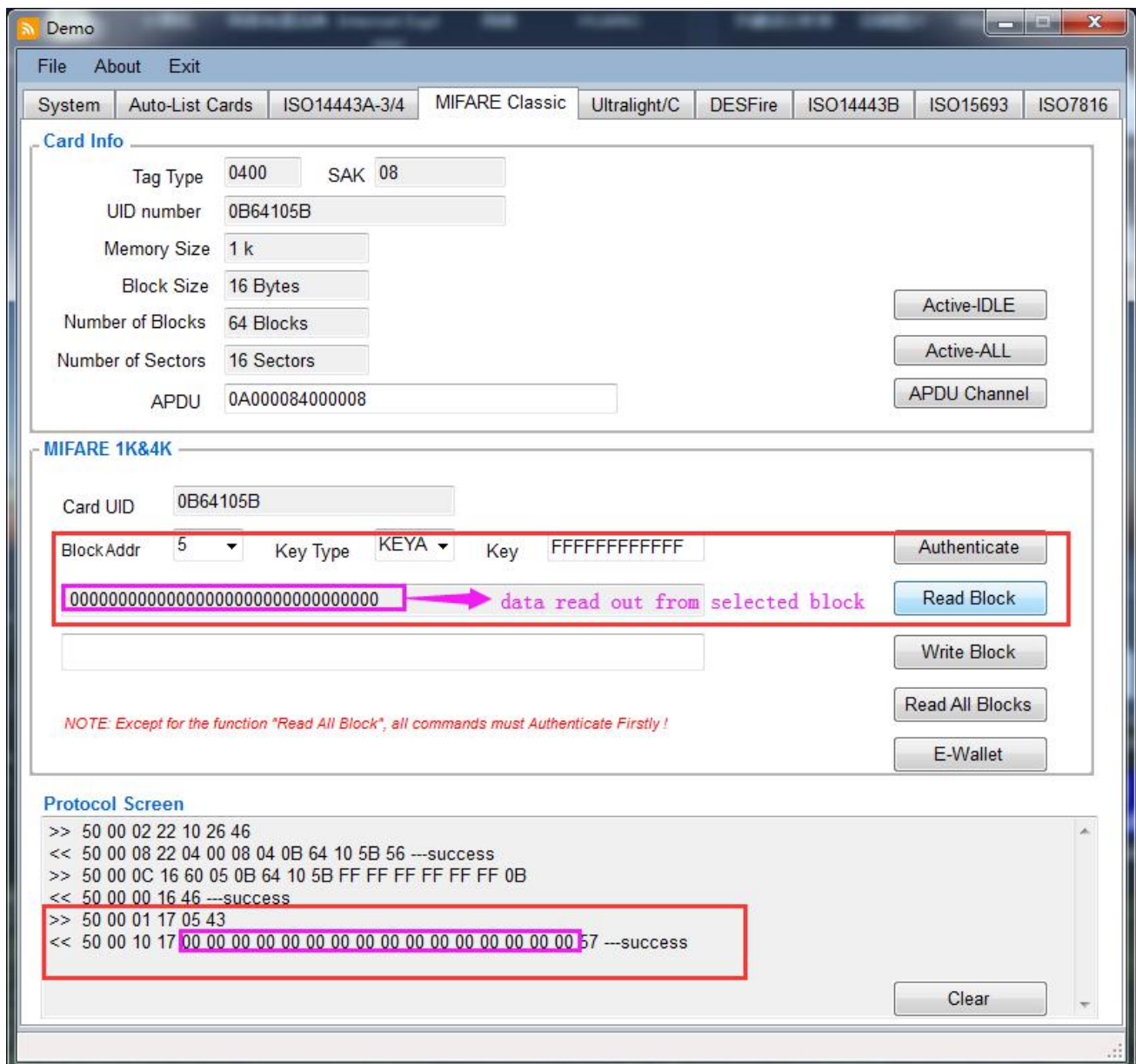
The parameters need to be selected including:

Block Addr: which block address to be read

Key Type: optional as KEYA or KEYB

Key: password of selected block (default value is FFFFFFFFFF for new card)

After Read Block, the data will be shown on the left side box also on Protocol Screen message box as below:



**Note:**

- 1) Before Read Block, it must do Active card-->Authenticate firstly
- 2) Please input the right Key value for the card which changed before

## 2.6.5 MIFARE Classic-Write Block

This function button is for writing data into according requested block, also for password changing operation, detail operations please refer to datasheet of MIFARE Classic cards

The parameters need to be selected including:

Block Addr: which block address to be written

Key Type: optional as KEYA or KEYB

Key: password of selected block (default value is FFFFFFFFFF for new card)

Data length: 17bytes

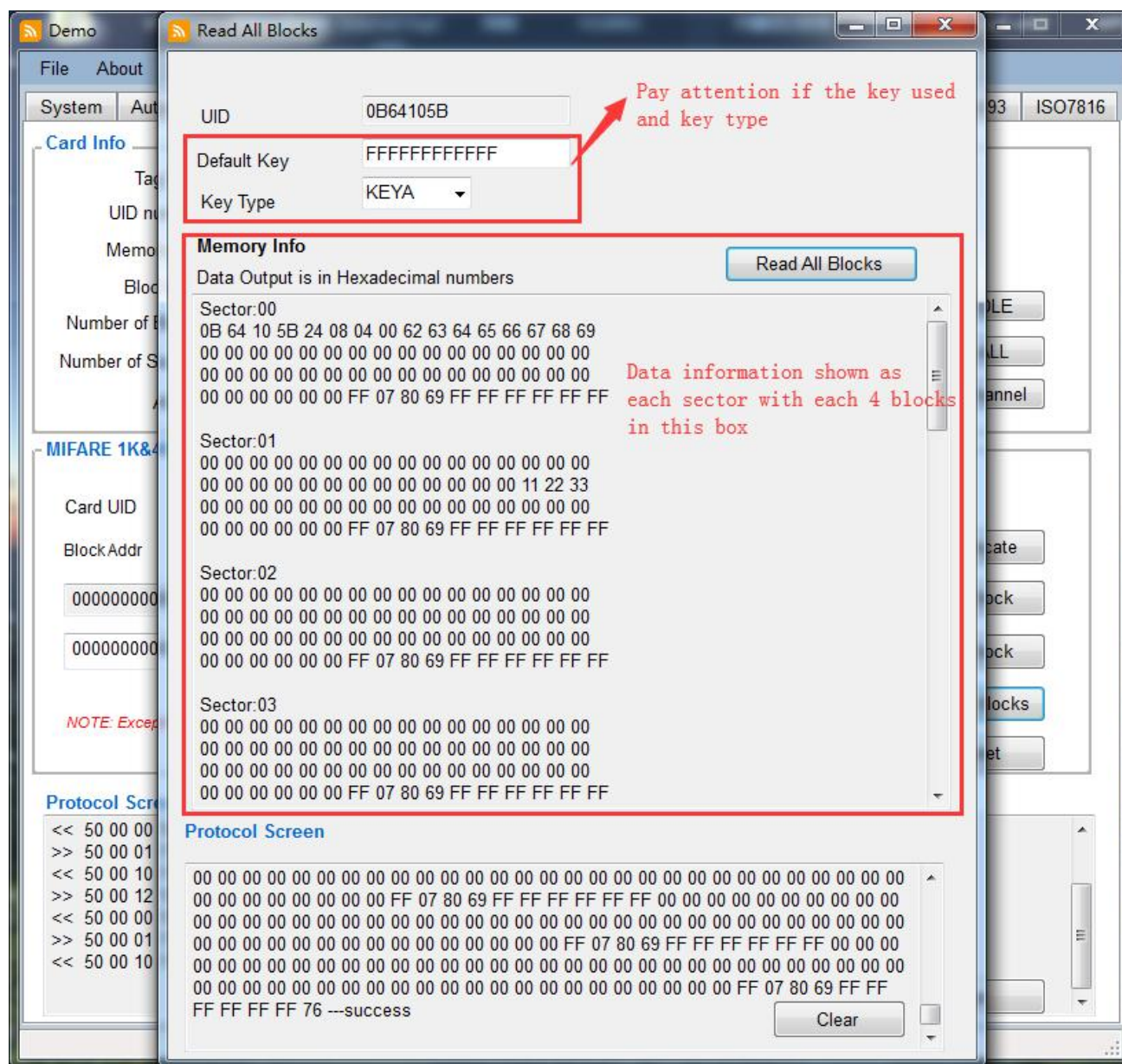
**Note:**

- 1) Before Write Block, it must do Active card-->Authenticate firstly
- 2) Please input the right Key value for the card which changed before
- 3) Please input right data length to be written
- 4) For password writing operation, pls refer to using card's datasheet for more details

## 2.6.6 MIFARE Classic-Read All Blocks

This is to get read out all blocks data in one time.

Before enter into Read All Blocks interface, it must do Active card firstly, but no need to do Authenticate. After entered Read All Blocks, please input right key value and Key Type to do Read, when succeed reading, all data information will be listing as each sector with each 4 blocks as following:

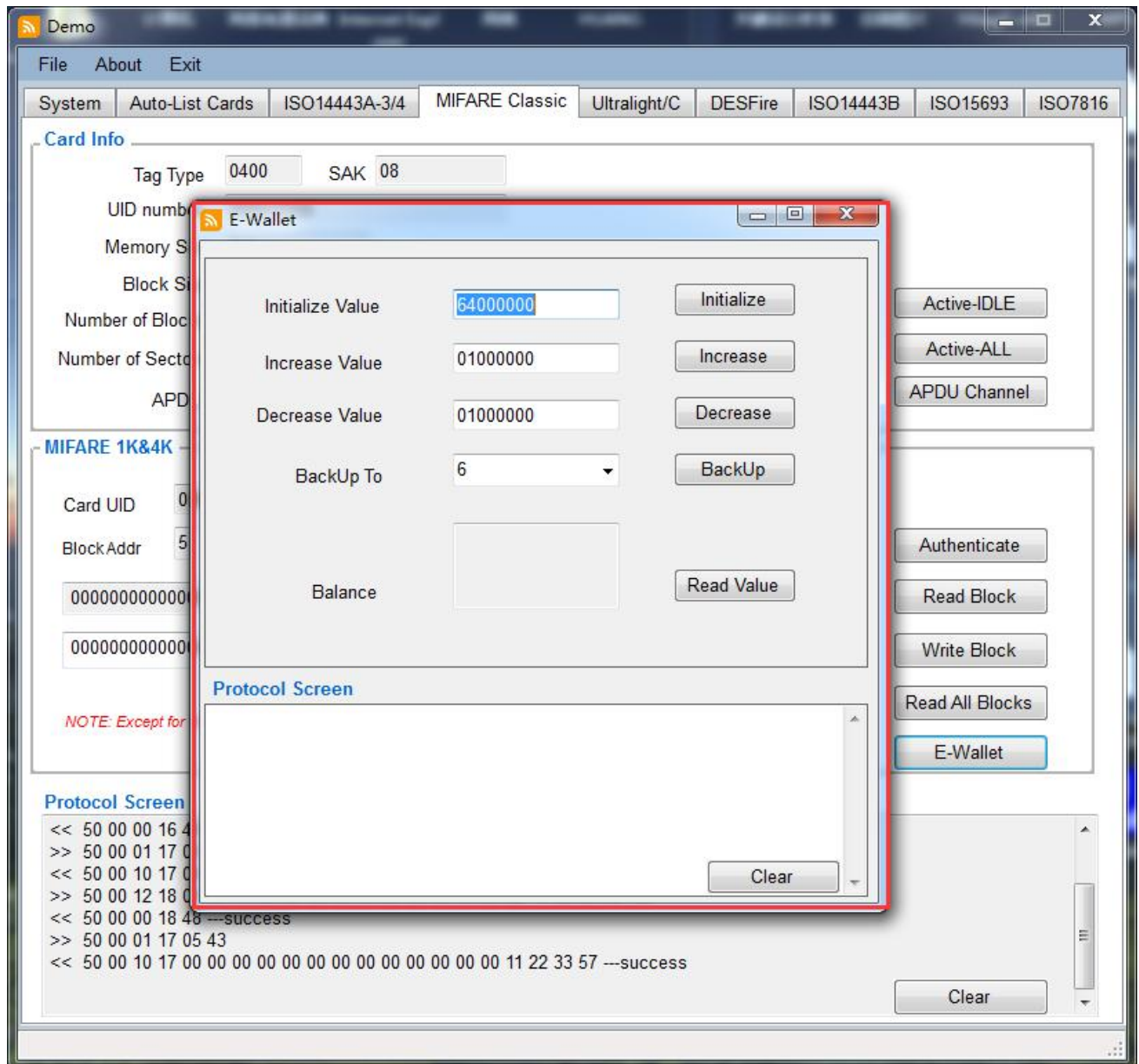


*Note: When there are some sectors or blocks' key differed from others default key, their data will be failed to be read.*



### 2.6.7 MIFARE Classic-E-wallet

This interface is available to do value operations directly for E-wallet function, please do according right setup for the values as below.



## 2.7 Ultralight/C

### 2.7.1 Ultralight/C-Active/Request Card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

When succeeded request card, the card's details information including card type, SAK, UID number, memory sizes, etc will be shown as below:

The screenshot displays the 'Demo' application window with the 'Ultralight/C' tab selected. The 'Card Info' section is highlighted with a red box, showing the following details:

- Tag Type: 4400
- SAK: 00
- UID number: 043E40BADA2580
- Memory Size: (empty field)
- Page Size: (empty field)
- Number of Pages: (empty field)
- APDU: 0A000084000008

To the right of the 'Card Info' section, the 'Active-IDLE' and 'Active-ALL' buttons are highlighted with a red box. Below these, the 'APDU Channel' button is visible.

The 'Ultralight/C' section contains the following fields and buttons:

- KEY: 49454D4B41455242214E4143554F5946
- New KEY: 00112233445566778899AABBCCDDEEFF
- PAGE ADDR: 5 (dropdown menu)
- Buttons: Authenticate, Change Key, Read Page, Write Page

A red note below the 'Ultralight/C' section states: "NOTE: For Ultralight C and compatible cards, you have to Authenticate firstly !"

The 'Protocol Screen' section at the bottom shows a red box highlighting the following data:

```
>> 50 00 02 22 10 26 46
<< 50 00 0B 22 44 00 00 07 04 3E 40 BA DA 25 80 85 ---success
```

A 'Clear' button is located at the bottom right of the 'Protocol Screen' section.

## 2.7.2 Ultralight/C--APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands please refer to ISO14443A-4 Standard .

The screenshot displays the 'Demo' application window with the 'Ultralight/C' tab selected. The interface is divided into three main sections: 'Card Info', 'Ultralight/C', and 'Protocol Screen'.

**Card Info Section:**

- Tag Type:  SAK
- UID number:
- Memory Size:
- Page Size:
- Number of Pages:
- APDU:  (highlighted with a red box)

**Ultralight/C Section:**

- KEY:
- New KEY:
- PAGE ADDR:

**Protocol Screen Section:**

- A large text area for displaying protocol data.
- 

**Buttons:**

- Active-IDLE
- Active-ALL
- APDU Channel

**NOTE:** For Ultralight C and compatible cards, you have to Authenticate firstly !

### 2.7.3 Ultralight C Authenticate

This is only opened for Ultralight C and its compatible cards which with password protected.

The common MIFARE Ultralight card/tag is without password protected and no need to do it.

Please input right KEY value to do authenticate for the card

The screenshot shows the 'Demo' application window with the 'Ultralight/C' tab selected. The 'Card Info' section displays fields for Tag Type (4400), SAK (00), UID number (043E40BADA2580), Memory Size, Page Size, Number of Pages, and APDU (0A000084000008). On the right, there are buttons for 'Active-IDLE', 'Active-ALL', and 'APDU Channel'. The 'Ultralight/C' section contains a 'KEY' field with the value '49454D4B41455242214E4143554F5946', a 'New KEY' field with '00112233445566778899AABBCCDDEEFF', and a 'PAGE ADDR' dropdown set to '5'. To the right of these fields are buttons for 'Authenticate', 'Change Key', 'Read Page', and 'Write Page'. A red rectangular box highlights the 'KEY' field and the 'Authenticate' button. Below these fields is a red note: 'NOTE: For Ultralight C and compatible cards, you have to Authenticate firstly !'. The 'Protocol Screen' at the bottom shows a successful authentication sequence: '>> 50 00 02 22 10 26 46' and '<< 50 00 0B 22 44 00 00 07 04 3E 40 BA DA 25 80 85 ---success'. A 'Clear' button is located at the bottom right of the protocol screen.

**Card Info**

Tag Type: 4400 SAK: 00  
UID number: 043E40BADA2580  
Memory Size:   
Page Size:   
Number of Pages:   
APDU: 0A000084000008

Active-IDLE  
Active-ALL  
APDU Channel

**Ultralight/C**

KEY: 49454D4B41455242214E4143554F5946  
New KEY: 00112233445566778899AABBCCDDEEFF  
PAGE ADDR: 5

Authenticate  
Change Key  
Read Page  
Write Page

*NOTE: For Ultralight C and compatible cards, you have to Authenticate firstly !*

**Protocol Screen**

```
>> 50 00 02 22 10 26 46
<< 50 00 0B 22 44 00 00 07 04 3E 40 BA DA 25 80 85 ---success
```

Clear



### 2.7.4 Ultralight C Change Key

This is only opened for Ultralight C and its compatible cards which with password protected.

And please do Authenticate with old KEY before Change Key.

The data length for the KEY value is 16bytes.

The screenshot shows the 'Demo' application window with the 'Ultralight/C' tab selected. The interface is divided into three main sections: 'Card Info', 'Ultralight/C', and 'Protocol Screen'.

**Card Info:** Displays card details including Tag Type (4400), SAK (00), UID number (043E40BADA2580), Memory Size, Page Size, Number of Pages, and APDU (0A000084000008). Buttons for 'Active-IDLE', 'Active-ALL', and 'APDU Channel' are on the right.

**Ultralight/C:** Contains fields for 'KEY' (49454D4B41455242214E4143554F5946) and 'New KEY' (00112233445566778899AABBCCDDEEFF), both highlighted with a red box. A 'Change Key' button is next to the 'New KEY' field. Below these are 'PAGE ADDR' (5) and buttons for 'Read Page' and 'Write Page'. A note at the bottom states: 'NOTE: For Ultralight C and compatible cards, you have to Authenticate firstly !'.

**Protocol Screen:** Shows a log of communication: '>> 50 00 02 22 10 26 46' and '<< 50 00 0B 22 44 00 00 07 04 3E 40 BA DA 25 80 85 ---success'. A 'Clear' button is at the bottom right.

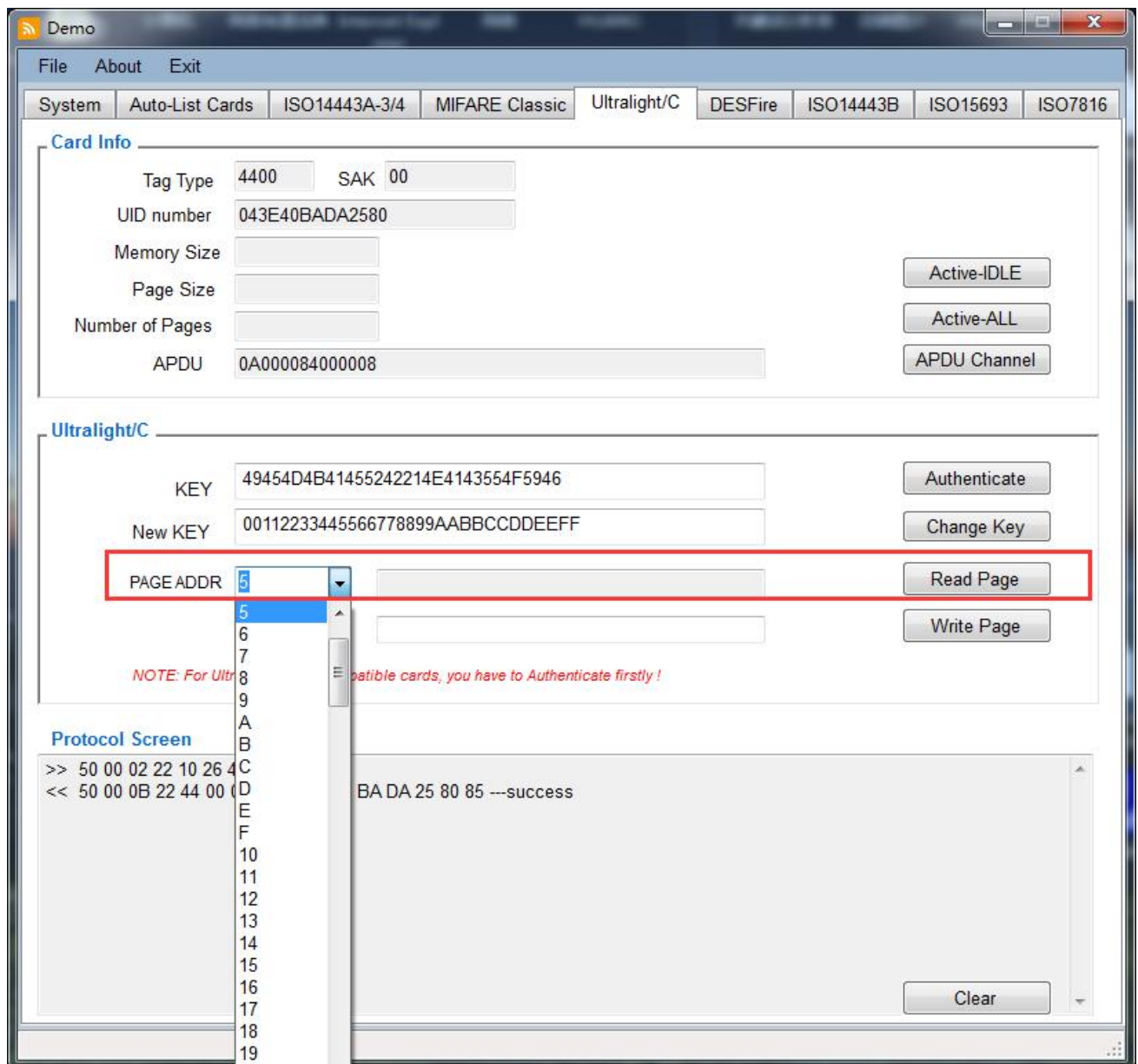
### 2.7.5 Ultralight /C Read Page

To get to read out the data stored in the according page address.

#### **And For MIFARE Ultralight C and its compatible cards, And NTAG 2xx series card**

before Read Page, Authenticate is needed firstly and make sure no remove of card after Active card.  
If there any remove, please again as Active-IDLE/Active-ALL --> Authenticate then Read Page with optional Page Address, as below:

For common MIFARE Ultralight card, Authenticate is no need.



### 2.7.6 Ultralight /C Write Page

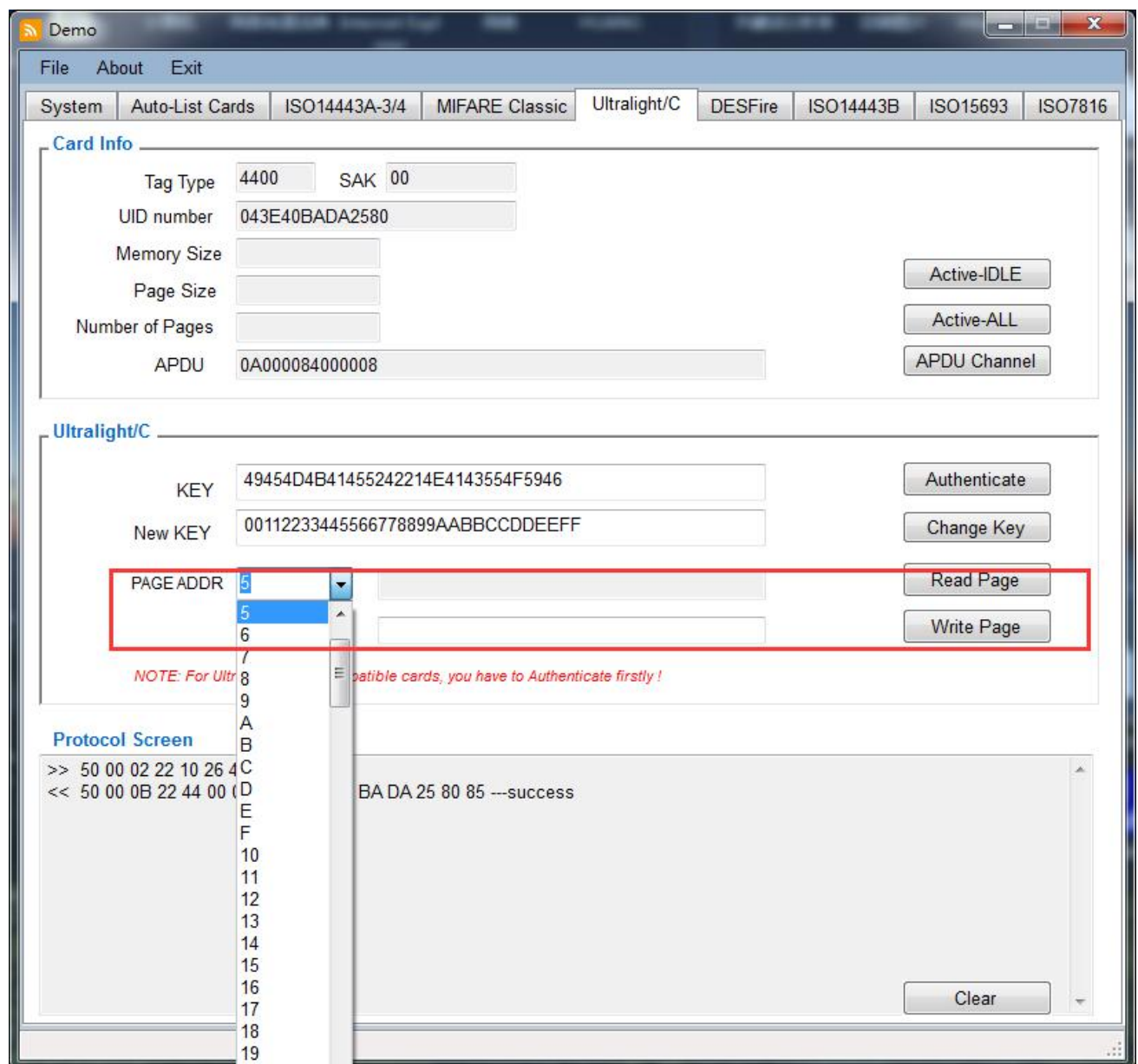
To Write the requested data into the according page address.

#### **And For MIFARE Ultralight C and its compatible cards, And NTAG 2xx series card**

Before Write Page, Authenticate is needed firstly and make sure no remove of card after Active card.

If there any remove, please again as Active-IDLE/Active-ALL --> Authenticate then Write Page to optional Page Address, as below:

For common MIFARE Ultralight card, Authenticate is no need.



*Note: Some specific page cannot be written please refer to datasheet of using card/tag.*

## 2.8 DESFire Interface

### 2.8.1 Active DESFire card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

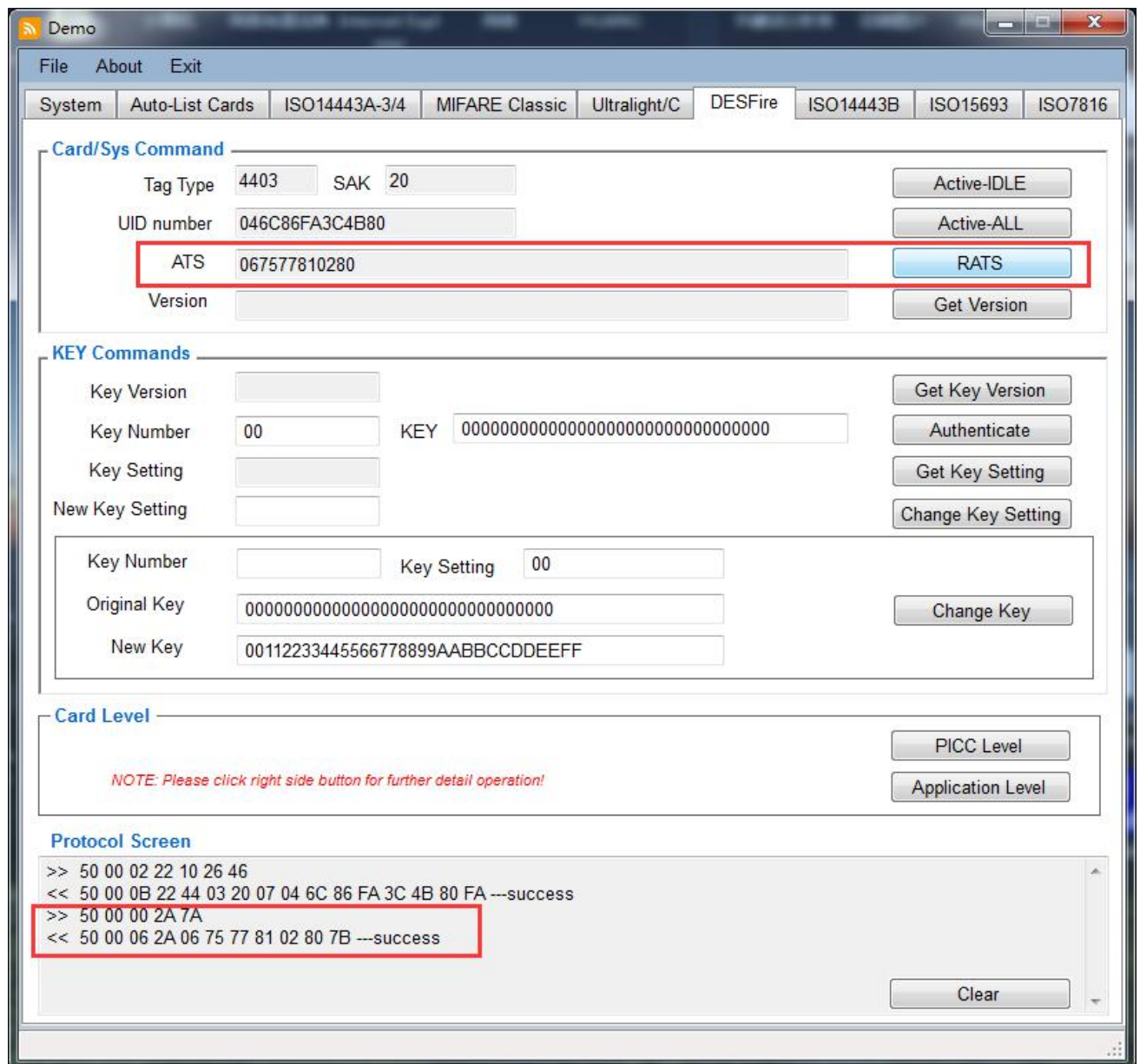
When succeeded request card, the card's detail information including card type, SAK, UID number will be shown as below:

The screenshot displays the 'Demo' application window with the 'DESFire' tab selected. The 'Card/Sys Command' section shows a red box highlighting the 'Active-IDLE' button, along with fields for Tag Type (4403), SAK (20), and UID number (046C86FA3C4B80). Below this, there are fields for ATS and Version, and buttons for RATS and Get Version. The 'KEY Commands' section includes fields for Key Version, Key Number (00), Key Setting, and New Key Setting, with buttons for Get Key Version, Authenticate, Get Key Setting, and Change Key Setting. A sub-section shows fields for Key Number, Key Setting (00), Original Key, and New Key, with a Change Key button. The 'Card Level' section has buttons for PICC Level and Application Level, with a note: 'NOTE: Please click right side button for further detail operation!'. The 'Protocol Screen' section shows a red box highlighting the command sequence: '>> 50 00 02 22 10 26 46' and '<< 50 00 0B 22 44 03 20 07 04 6C 86 FA 3C 4B 80 FA ---success'. A 'Clear' button is located at the bottom right of the Protocol Screen.

## 2.8.2 DESFire Card-RATS

RATS= Request for Answer to Select

And the response to RATS is the “Answer to Select” ATS, and the ATS consists of specified bytes for communicate between PICC capabilities and PCD. Details specific byte’s meaning, please refer to datasheet of using card.

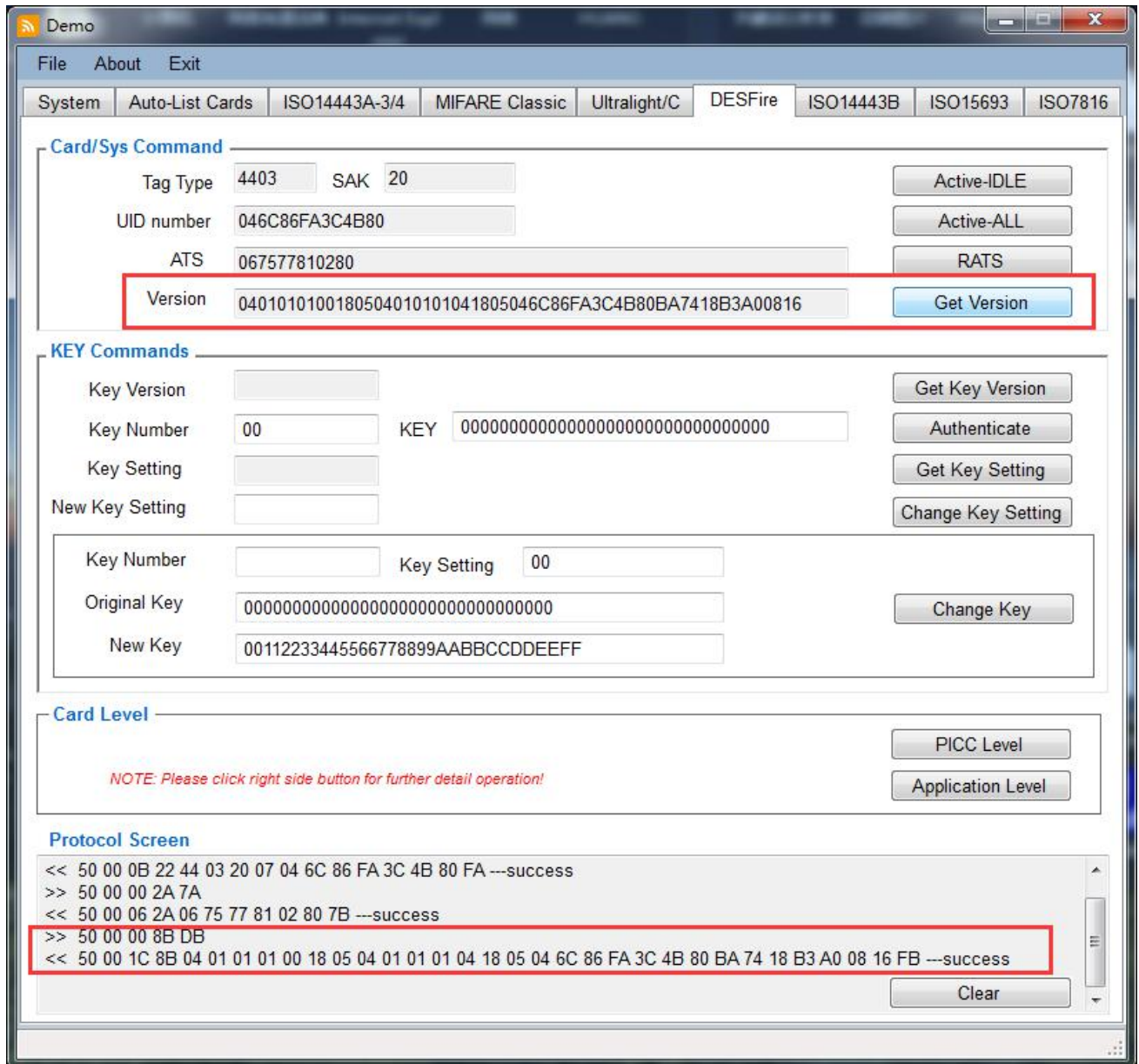


*Note: Before RATS, Active-IDLE/Active-ALL is needed firstly.*



### 2.8.3 DESFire Card-Get Version

To get the returned manufacturing related data of the DESFire cards



*Note:*

*Active-IDLE/Active-ALL-->>RATS is needed before Get Version.*

## 2.8.4 DESFire Card-Get Key Version

The Get Key Version command allows to read out the current key version of any key stored on the card.

*Operation procedure: Active-IDLE/Active-ALL --> RATS --> Get Key Version*

The screenshot shows the 'Demo' application window with the 'DESFire' tab selected. The 'Card/Sys Command' section displays card details: Tag Type 4403, SAK 20, UID number 046C86FA3C4B80, ATS 067577810280, and Version 0401010100180504010101041805046C86FA3C4B80BA7418B3A00816. On the right, buttons for 'Active-IDLE', 'Active-ALL', 'RATS', and 'Get Version' are visible.

The 'KEY Commands' section is highlighted with a red box. It contains the following fields and buttons:

- Key Version:** 00, with a 'Get Key Version' button.
- Key Number:** 00, **KEY:** 00000000000000000000000000000000, with an 'Authenticate' button.
- Key Setting:** (empty), with a 'Get Key Setting' button.
- New Key Setting:** (empty), with a 'Change Key Setting' button.
- Key Number:** (empty), **Key Setting:** 00, with a 'Change Key' button.
- Original Key:** 00000000000000000000000000000000, with a 'Change Key' button.
- New Key:** 00112233445566778899AABBCCDDEEFF, with a 'Change Key' button.

The 'Card Level' section shows 'PICC Level' and 'Application Level' buttons, with a note: 'NOTE: Please click right side button for further detail operation!'.

The 'Protocol Screen' section shows a list of commands and responses:

```
<< 50 00 06 2A 06 75 77 81 02 80 7B ---success
>> 50 00 00 8B DB
<< 50 00 1C 8B 04 01 01 01 00 18 05 04 01 01 01 04 18 05 04 6C 86 FA 3C 4B 80 BA 74 18 B3 A0 08 16 FB ---success
>> 50 00 01 85 00 D4
<< 50 00 01 85 00 D4 ---success
```

The last two lines of the protocol screen are highlighted with a red box. A 'Clear' button is located at the bottom right of the protocol screen.

### 2.8.5 DESFire Card- Key Authenticate

This procedure is not only confirm that both card/tag and reader device can trust each other, but also generates a session key which can be used to keep the further communication path secure.

Note Master Keys are identified by their key number 0x00, this is valid on PICC level (selected AID=0x00) and on Application Level.

**Operation procedure: Active-IDLE/Active-ALL --> RATS --> Authenticate**

The screenshot displays the 'Demo' application window with the 'DESFire' card type selected. The interface is divided into several sections:

- Card/Sys Command:** Fields for Tag Type (4403), SAK (20), UID number (046C86FA3C4B80), ATS (067577810280), and Version (0401010100180504010101041805046C86FA3C4B80BA7418B3A00816). Buttons for 'Active-IDLE', 'Active-ALL', 'RATS', and 'Get Version' are on the right.
- KEY Commands:** Fields for Key Version (00), Key Number (00), and KEY (00000000000000000000000000000000). A red box highlights the 'Authenticate' button. Other buttons include 'Get Key Version', 'Get Key Setting', 'Change Key Setting', and 'Change Key'.
- Card Level:** Buttons for 'PICC Level' and 'Application Level'. A note states: 'NOTE: Please click right side button for further detail operation!'.
- Protocol Screen:** A log of communication commands and responses. A red box highlights the following sequence:
 

```
>> 50 00 11 81 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0
<< 50 00 00 81 D1 ---success
```

 A 'Clear' button is at the bottom right.



### 2.8.6 DESFire Card- Get Key Setting

This function command allows to get configuration information on the card/tag and application master key configuration setting.

It returns the maximum number of keys which can be stored within the selected application.

Before Get Key Setting, a proceeding authentication with the master key is required.

**Operation procedure: Active-IDLE/Active-ALL --> RATS --> Authenticate --> Get Key Setting**

The screenshot displays the 'Demo' application window with the 'DESFire' tab selected. The 'Card/Sys Command' section shows the following fields: Tag Type (4403), SAK (20), UID number (046C86FA3C4B80), ATS (067577810280), and Version (0401010100180504010101041805046C86FA3C4B80BA7418B3A00816). The 'KEY Commands' section is highlighted with a red box, showing the 'Key Setting' field set to '0F' and the 'Get Key Setting' button. Below this, the 'New Key Setting' field is empty, and the 'Change Key Setting' button is visible. The 'Card Level' section shows 'PICC Level' and 'Application Level' buttons. The 'Protocol Screen' at the bottom shows a series of hexadecimal commands and responses, with the last two lines highlighted by a red box: '>> 50 00 02 82 0F 01 DE ---success' and '<< 50 00 02 82 0F 01 DE ---success'.

**Card/Sys Command**

Tag Type: 4403 SAK: 20  
 UID number: 046C86FA3C4B80  
 ATS: 067577810280  
 Version: 0401010100180504010101041805046C86FA3C4B80BA7418B3A00816

**KEY Commands**

Key Version: 00  
 Key Number: 00 KEY: 00000000000000000000000000000000  
 Key Setting: 0F  
 New Key Setting:   
 Key Number: Key Setting: 00  
 Original Key: 00000000000000000000000000000000  
 New Key: 00112233445566778899AABBCCDDEEFF

**Card Level**

PICC Level  
 Application Level

**Protocol Screen**

```
<< 50 00 01 85 00 D4 ---success
>> 50 00 11 81 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0
<< 50 00 00 81 D1 ---success
>> 50 00 02 82 0F 01 DE ---success
<< 50 00 02 82 0F 01 DE ---success
```

### 2.8.7 DESFire Card- Change Key Setting

This command changes the master key configuration setting depending on the currently selected AID.

This command takes one byte as parameter which codes the new master key settings., details configuration changeable bits, please refer to detail datasheet of using card.

Authenticate is needed before Change Key Setting.

**Operation procedure: Active-IDLE/Active-ALL --> RATS --> Authenticate --> Change Key Setting**

The screenshot shows the 'Demo' application window with the 'DESFire' tab selected. The interface is divided into several sections:

- Card/Sys Command:** Contains fields for Tag Type (4403), SAK (20), UID number (046C86FA3C4B80), ATS (067577810280), and Version (0401010100180504010101041805046C86FA3C4B80BA7418B3A00816). Buttons on the right include 'Active-IDLE', 'Active-ALL', 'RATS', and 'Get Version'.
- KEY Commands:** Contains fields for Key Version (00), Key Number (00), Key Setting (0F), and a KEY field with a long hexadecimal string. Buttons on the right include 'Get Key Version', 'Authenticate', 'Get Key Setting', and 'Change Key Setting'. The 'Change Key Setting' button is highlighted with a red box.
- Card Level:** Contains buttons for 'PICC Level' and 'Application Level'. A note below reads: 'NOTE: Please click right side button for further detail operation!'.
- Protocol Screen:** A text area showing a sequence of commands and responses:
 

```
<< 50 00 01 85 00 D4 ---success
>> 50 00 11 81 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0
<< 50 00 00 81 D1 ---success
>> 50 00 00 82 D2
<< 50 00 02 82 0F 01 DE ---success
```

 A 'Clear' button is located at the bottom right of this section.

### 2.8.8 DESFire Card- Change Key

This command allows to change any key stored on the card/tag.

Parameter value to be changed:

Key Number: One byte length and has to be range from 0x00 to number of application key to 1

Key Setting: Whether a change of key is permit or not and show which key is need for Authenticate before the Change key command

Original Key: Old key

New Key: the key to be changed

To the Change Key Key or Master Key, Authenticate Master Key is necessary. Other details for specific operations, please refer to datasheet of using card.

**Operation procedure: Active-IDLE/Active-ALL --> RATS --> Authenticate --> Change Key**

The screenshot displays the 'Demo' application window with a menu bar (File, About, Exit) and a tabbed interface. The 'DESFire' tab is selected, showing card details and key management options.

**Card/Sys Command**

Tag Type	4403	SAK	20	Active-IDLE
UID number	046C86FA3C4B80			Active-ALL
ATS	067577810280			RATS
Version	0401010100180504010101041805046C86FA3C4B80BA7418B3A00816			Get Version

**KEY Commands**

Key Version	00	Get Key Version
Key Number	00	KEY 00000000000000000000000000000000
Key Setting	0F	Authenticate
New Key Setting		Get Key Setting
		Change Key Setting

**Change Key Section (highlighted with a red box):**

Key Number	00	Key Setting	00
Original Key	00000000000000000000000000000000		
New Key	00112233445566778899AABBCCDDEEFF		
Change Key			

**Card Level**

NOTE: Please click right side button for further detail operation!

PICC Level  
Application Level

**Protocol Screen**

```
<< 50 00 01 85 00 D4 ---success
>> 50 00 11 81 00 00 00 00 00 00 00 00 00 00 00 00 C0
<< 50 00 00 81 D1 ---success
>> 50 00 00 82 D2
<< 50 00 02 82 0F 01 DE ---success
```

Clear

## 2.8.9 DESFire Card- PICC Level

This interface is for PICC application operations.

When enter into PICC Level interface, Authenticate Master Key is necessary

**Operation procedure: Active-IDLE/Active-ALL --> RATS --> Authenticate --> PICC Level**

The screenshot shows the 'Demo' application window with the 'DESFire' tab selected. The interface is divided into several sections:

- Card/Sys Command:** Fields for Tag Type (4403), SAK (20), UID number (046C86FA3C4B80), ATS (067577810280), and Version (0401010100180504010101041805046C86FA3C4B80BA7418B3A00816). Buttons on the right include Active-IDLE, Active-ALL, RATS, and Get Version.
- KEY Commands:** Fields for Key Version (00), Key Number (00), Key Setting (0F), and New Key Setting. A large KEY field contains a long hexadecimal string. Buttons on the right include Get Key Version, Authenticate (marked with a red '1'), Get Key Setting, and Change Key Setting.
- Card Level:** Fields for Key Number (00), Key Setting (00), Original Key (00000000000000000000000000000000), and New Key (00112233445566778899AABBCCDDEEFF). A button 'Change Key' is on the right. Below this, a 'Card Level' section has a 'PICC Level' button (marked with a red '2' and a red box) and an 'Application Level' button. A note says: 'NOTE: Please click right side button for further detail operation!'
- Protocol Screen:** A text area showing a sequence of hexadecimal commands and responses:
 

```
<< 50 00 00 81 D1 ---success
>> 50 00 00 82 D2
<< 50 00 02 82 0F 01 DE ---success
>> 50 00 11 81 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C0
<< 50 00 00 81 D1 ---success
```

 A 'Clear' button is at the bottom right.



### 2.8.9.1 PICC Level-Create Application

This command allows to create new application on the PICC

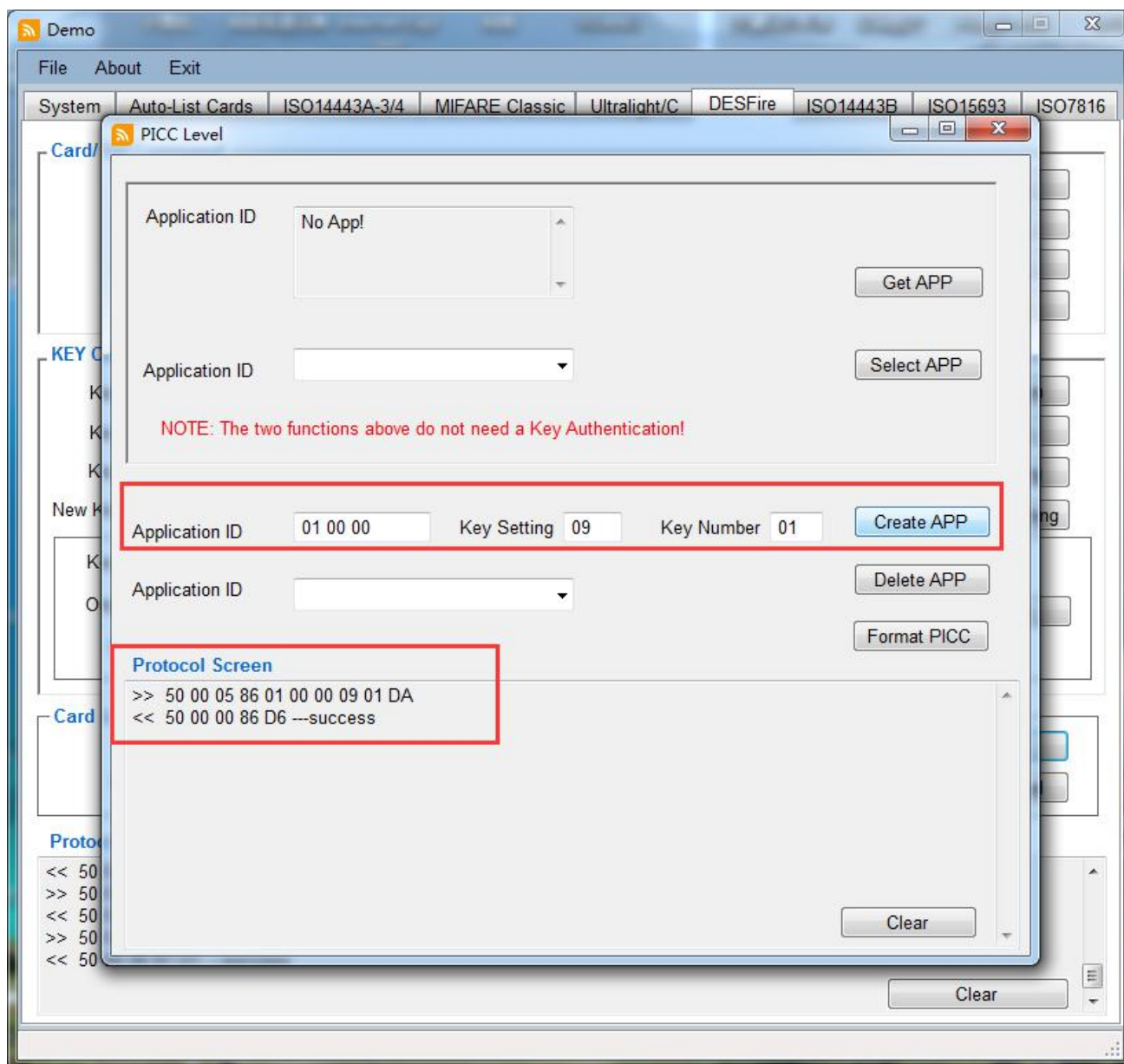
Parameters to be operated:

Application ID(AID): 24 bit number=0x00 00 00 and reserved as reference to the PICC itself

Key Setting: Application Master Key Setting as defined in [Chapter 2.8.6](#)

Key Number: Number of Keys defines how many keys can be stored within the application for cryptographic purposes

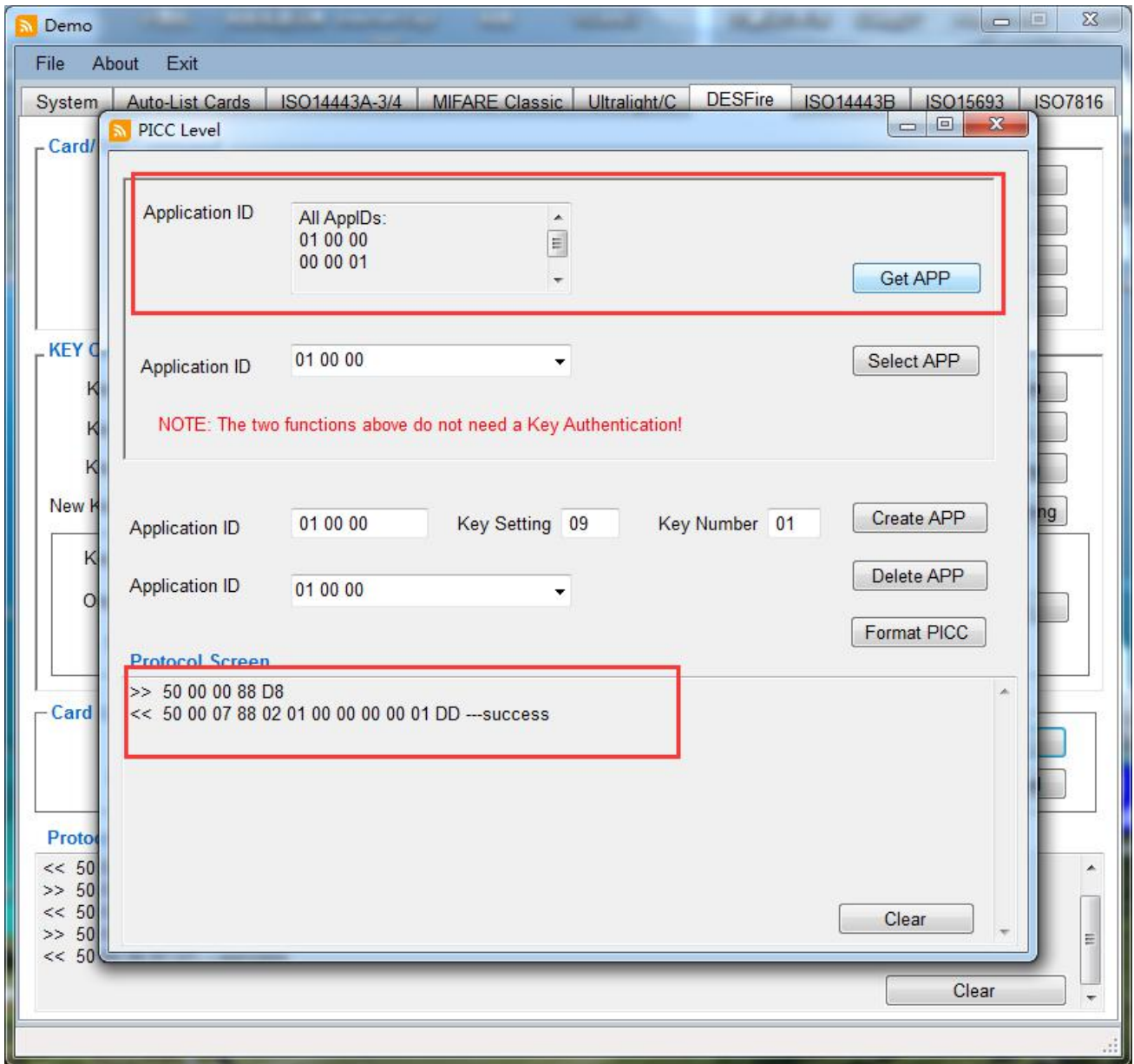
For example below:



*Note: Proceeding PICC Master key authentication may be required*

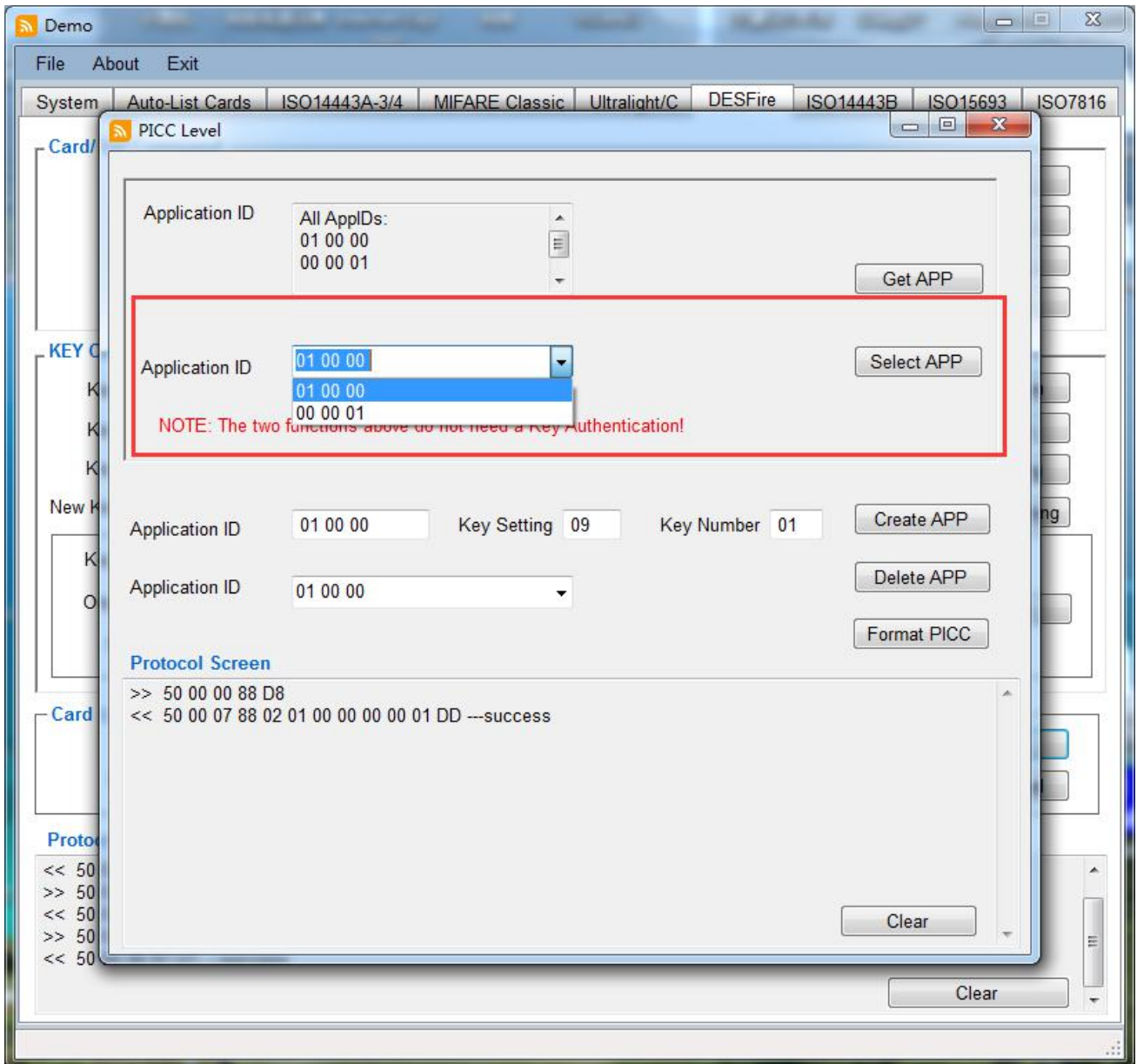
### 2.8.9.2 PICC Level-Get Application

To Get the Application ID or IDs stored in the card.



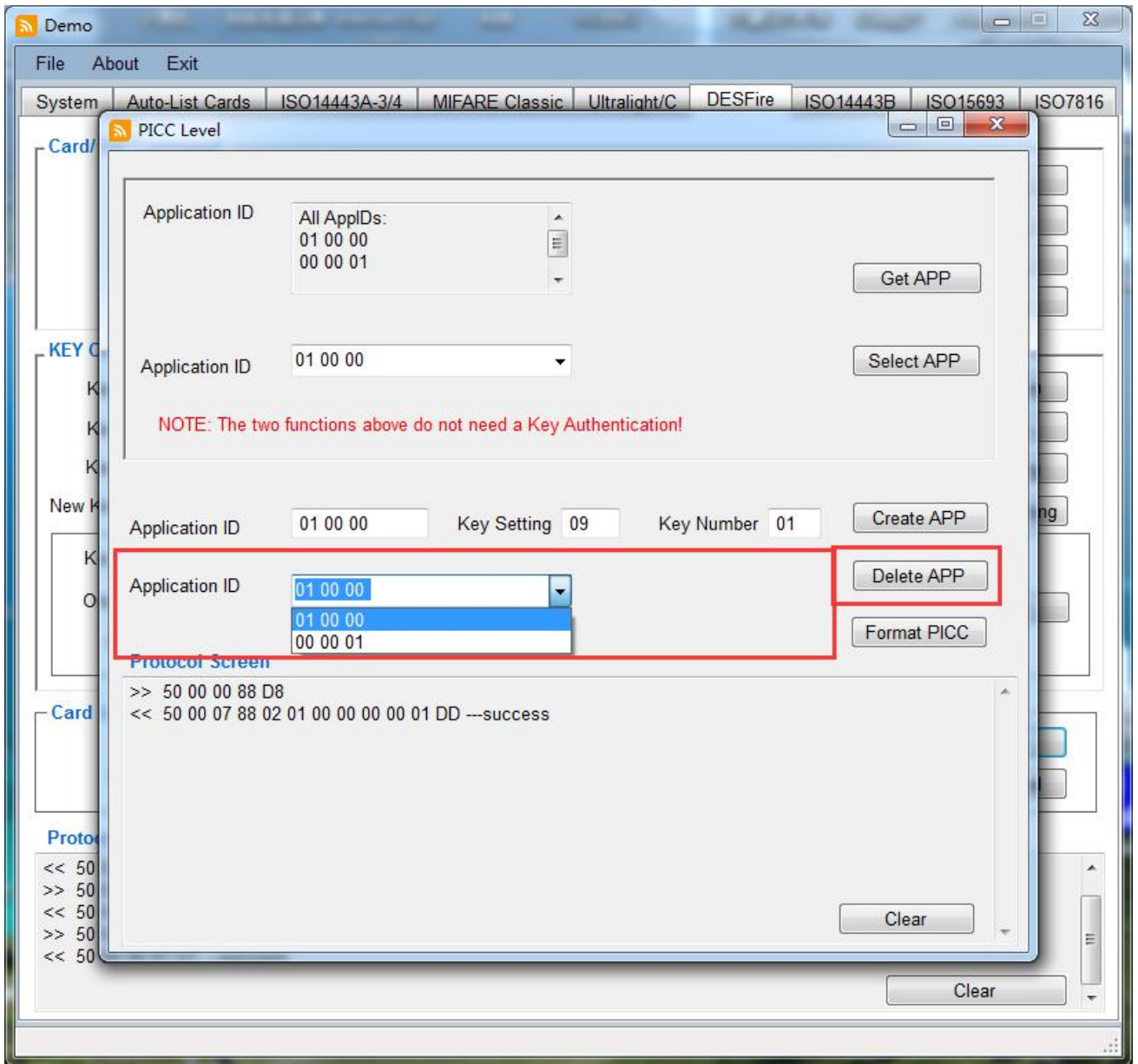
### 2.8.9.3 PICC Level-Select Application

To select the Application ID going for next further Application Level operations



#### 2.8.9.4 PICC Level-Delete Application

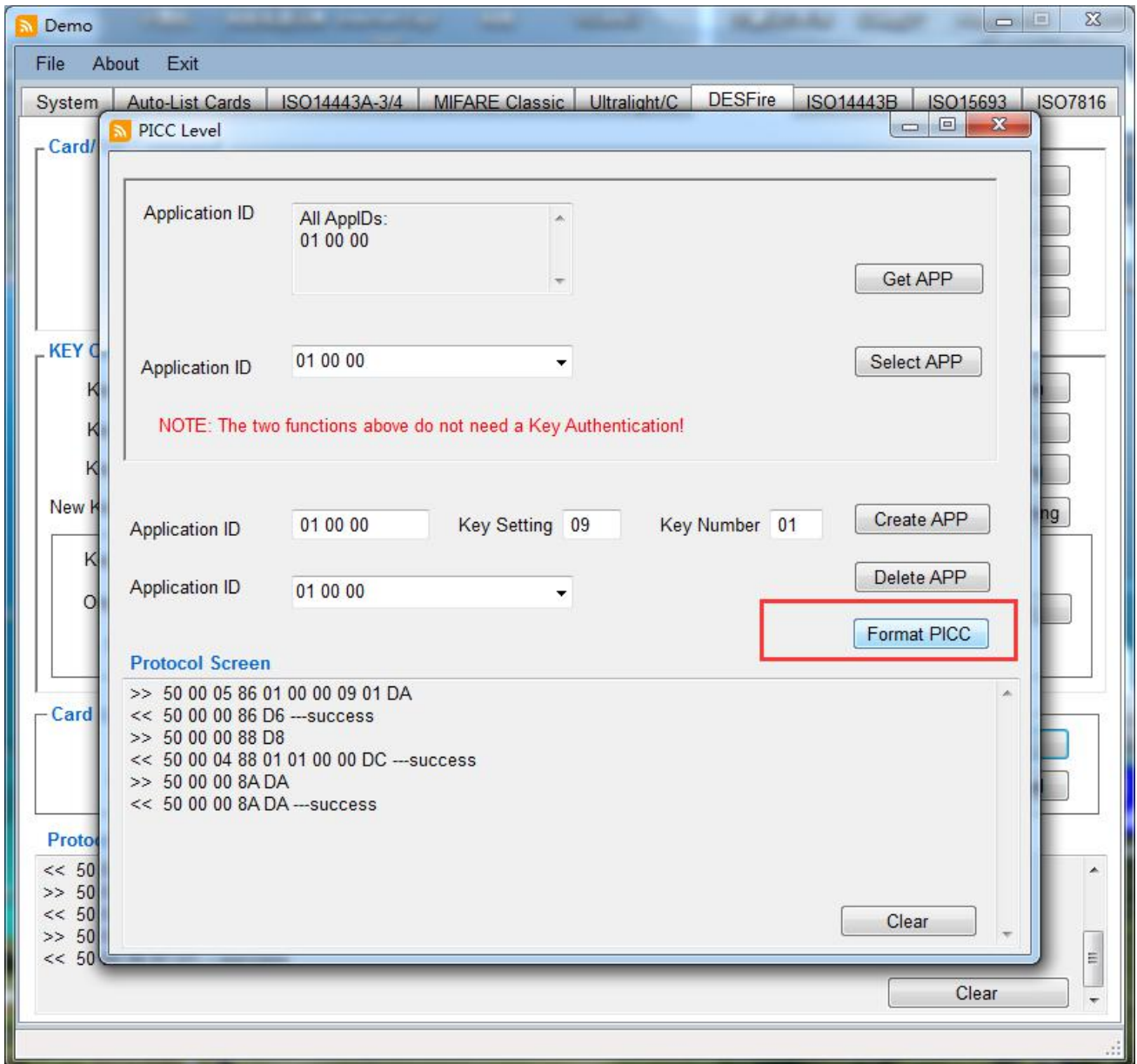
This command is to delete the application ID or IDs, the all application IDs will be listing on left side box.





### 2.8.9.5 PICC Level-Format PICC

This command releases the PICC user memory and no parameter are passed with this command



### 2.8.10 DESFire Card- Application Level

When enter into Application Level, it must do Select APP --> Authenticate Master Key firstly .

The screenshot displays the 'Demo' application window with the 'DESFire' tab selected. The interface is organized into several sections:

- Card/Sys Command:** Contains fields for Tag Type (4403), SAK (20), UID number (042F171AEB2F80), ATS (067577810280), and Version (04010101001A0504010101041A05042F171AEB2F80BA351765604712). Buttons on the right include 'Active-IDLE', 'Active-ALL', 'RATS', and 'Get Version'.
- KEY Commands:** Includes fields for Key Version, Key Number (00), Key Setting, and New Key Setting. A large 'KEY' field contains a long hexadecimal string. Buttons on the right include 'Get Key Version', 'Authenticate', 'Get Key Setting', and 'Change Key Setting'. Below this, there are fields for Key Number, Key Setting (00), Original Key, and New Key, with a 'Change Key' button.
- Card Level:** Features a 'NOTE: Please click right side button for further detail operation!' and two buttons: 'PICC Level' and 'Application Level'. The 'Application Level' button is highlighted with a red rectangle.
- Protocol Screen:** A text area showing communication logs with hexadecimal data and status messages like '<< 50 00 00 81 D1 ---success'. A 'Clear' button is located at the bottom right.

### 2.8.10.1 Application Level-Get File IDs

This command returns the File IDs of all active files within the currently selected application

The screenshot displays the 'ApplicationLevel' window with the following sections:

- File IDs:** A list box showing 'No Files'. To its right are buttons for 'Get FileID' and 'Delete File'.
- File ID:** A dropdown menu.
- File Setting:** A section containing:
  - File ID: dropdown
  - File Type: dropdown
  - Communicate way: dropdown
  - Access right: dropdown
  - File size: dropdown
  - Buttons: 'Get File Setting' and 'Change File Setting'.
- Standard DataFile & Backup File:** A section containing:
  - File ID: dropdown
  - Communicate way: dropdown
  - Access right: dropdown
  - File size: dropdown
  - Buttons: 'Create StdFile' and 'Create BackupFile'.
  - NOTE:** StdFile means to Standard Data File
  - File ID: dropdown
  - Address: dropdown
  - Length: dropdown
  - Data: text area
  - Buttons: 'Read Data' and 'Write Data'.
  - ☐ BackupFile
- Value File & Record File:** A section containing:
  - Buttons: 'Value File' and 'Record File'.
  - NOTE:** Please click right side button for further detail operation!
- Protocol Screen:** A text area showing the following protocol data:

```
>> 50 00 00 8C DC
<< 50 00 01 8C 00 DD ---success
```

  - Button: 'Clear'.

### 2.8.10.2 Application Level-Get File Setting

To Get information on the properties of a specific file, and the File ID need to be selected when proceeding

The screenshot displays the 'ApplicationLevel' software window. The 'File Setting' section is highlighted with a red rectangle. It contains the following fields and buttons:

- File IDs:** A list box showing '05'.
- File ID:** A dropdown menu showing '05'.
- Get FileID:** A button.
- Delete File:** A button.
- File Setting:** A section header.
- File ID:** A dropdown menu showing '05'.
- File Type:** A dropdown menu showing '00'.
- Communicate way:** A dropdown menu showing '00'.
- Access right:** A dropdown menu showing 'EEEE'.
- File size:** A text box showing '10 00 00'.
- Get File Setting:** A button.
- Change File Setting:** A button.

Below the 'File Setting' section is the 'Standard DataFile & Backup File' section, which includes fields for File ID, Communicate way, Access right, File size, and buttons for 'Create StdFile', 'Create BackupFile', 'Read Data', and 'Write Data'. A 'BackupFile' checkbox is also present.

The 'Value File & Record File' section contains a 'Value File' button, a 'Record File' button, and a note: 'NOTE: Please click right side button for further detail operation!'.

The 'Protocol Screen' section at the bottom shows a list of protocol messages. The last two messages are highlighted with a red rectangle:

```
<< 50 00 01 8C 00 DD ---success
>> 50 00 01 8D 05 D9
<< 50 00 07 8D 07 00 00 EE EE 10 00 CD ---success
```

A 'Clear' button is located at the bottom right of the 'Protocol Screen' section.

### 2.8.10.3 Application Level-Change File Settings

This is to change the access parameters of an existing file.

Parameters to be changed:

File ID: file number within currently selected application, One byte

Communication way: new communication settings, One byte

Access right: new access rights, Two byte

More details information, please refer to datasheet of using card accordingly

The screenshot shows the 'ApplicationLevel' software window. It contains several sections for file management:

- File IDs:** A list box showing '05' and a 'Get FileID' button.
- File ID:** A dropdown menu showing '05' and a 'Delete File' button.
- File Setting:** A section with fields for File ID (05), File Type (00), Communicate way (00), Access right (EEEE), and File size (10 00 00). It includes a 'Get File Setting' button and a 'Change File Setting' button (highlighted with a red box).
- Standard DataFile & Backup File:** A section with fields for File ID (05), Communicate way (00), Access right (EE EE), and File size (10 00 00). It includes 'Create StdFile' and 'Create BackupFile' buttons. Below this is a 'NOTE: StdFile means to Standard Data File'.
- Value File & Record File:** A section with fields for File ID (05), Address (00 00), and Length (04 00). It includes 'Read Data' and 'Write Data' buttons. A 'BackupFile' checkbox is also present.
- Protocol Screen:** A section at the bottom showing a list of protocol messages: '>> 50 00 04 8E 05 00 EE EE DF' and '<< 50 00 00 8E DE ---success'. A 'Clear' button is at the bottom right.



#### 2.8.10.4 Application Level-Create Std Data File/ Create Backup Data file

This is used to create files for the storage of plain unformatted user data within an existing application on the PICC, and Create Backup Data File supporting the feature of an integrated backup mechanism.

Parameters to be created:

File ID: File number of the new file and range from 0x00 to 0x0F, ONE byte

Communicate way: Communication setting, ONE byte

Access right: Access right for the new file, TWO byte

File size: the file of the file in byte, THREE byte

More details information, please refer to datasheet of using card accordingly

The screenshot displays the 'ApplicationLevel' software window. It features several sections for configuring file creation:

- File IDs:** A list box showing 'No Files' and a 'Get FileID' button.
- File ID:** A dropdown menu and a 'Select File' button.
- File Setting:** A section with fields for File ID, File Type, Communicate way, Access right, and File size, along with 'Get File Setting' and 'Change File Setting' buttons.
- Standard DataFile & Backup File:** This section contains fields for File ID (highlighted with a red box and containing '05'), Communicate way (00), Access right (EE EE), and File size (10 00 00, highlighted with a purple box). Below these fields, a note states 'NOTE: StdFile means to Standard Data File'. To the right of the File size field, the text 'LSB first' is written in purple. Buttons for 'Create StdFile' and 'Create BackupFile' are present.
- Value File & Record File:** A section with a note 'NOTE: Please click right side button for further detail operation!' and buttons for 'Value File' and 'Record File'.
- Protocol Screen:** A text area showing a sequence of hexadecimal data and status messages:
 

```
>> 50 00 00 8C DC
<< 50 00 01 8C 00 DD ---success
>> 50 00 06 8F 05 00 EE EE 10 00 CC
<< 50 00 00 8F DF ---success
```

 A 'Clear' button is located at the bottom right of this section.



### 2.8.10.5 Application Level-Delete File

This command is to permanently deactivate a file within the file directory of currently selected application

This operation invalidates the file directory entry of the specified file which means that the file can't be accessed anymore.

The screenshot shows the 'ApplicationLevel' software interface. At the top, there is a 'File IDs' list showing 'No Files'. Below this, a red rectangular box highlights the 'File ID' dropdown menu and the 'Delete File' button. The interface is divided into several sections: 'File Setting' (containing fields for File ID, File Type, Communicate way, Access right, and File size, with buttons for 'Get File Setting' and 'Change File Setting'), 'Standard DataFile & Backup File' (containing fields for File ID, Communicate way, Access right, and File size, with buttons for 'Create StdFile' and 'Create BackupFile'), and 'Value File & Record File' (containing fields for File ID, Address, and Length, with buttons for 'Read Data' and 'Write Data'). A 'Protocol Screen' section at the bottom contains a large text area and a 'Clear' button. A red note is visible: 'NOTE: StdFile means to Standard Data File'.

### 2.8.10.6 Application Level-Read Data

To read data from Standard Data Files or Backup Data Files

Parameters to be operated:

File ID: the file number to be read from, ONE byte

Address: the starting position for the read operation, THREE byte, range from 0x00 00 00 to 0x FF FF FF

Length: the number of data bytes to be read, THREE byte, and range 0x00 00 00 to 0x FF FF FF

The screenshot shows the 'ApplicationLevel' software window with the following sections and controls:

- File IDs:** A list box containing '05'. Buttons: 'Get FileID', 'Delect File'.
- File ID:** A dropdown menu showing '05'. Buttons: 'Get File Setting', 'Change File Setting'.
- File Setting:**
  - File ID: '05' (dropdown)
  - File Type: '00' (dropdown)
  - Communicate way: '00' (dropdown)
  - Access right: 'EEEE' (text box)
  - File size: '10 00 00' (text box)
  - Buttons: 'Get File Setting', 'Change File Setting'
- Standard DataFile & Backup File:**
  - File ID: '00' (dropdown)
  - Communicate way: '00' (dropdown)
  - Access right: 'EE EE' (text box)
  - File size: '00 00 00' (text box)
  - Buttons: 'Create StdFile', 'Create BackupFile'
  - NOTE: StdFile means to Standard Data File**
  - File ID: '05' (dropdown)
  - Address: '00 00' (text box)
  - Length: '04 00' (text box)
  - Data: '00000000' (text box)
  - Buttons: 'Read Data' (highlighted with a red box), 'Write Data'
  - ☐ BackupFile
- Value File & Record File:**
  - Buttons: 'Value File', 'Record File'
  - NOTE: Please click right side button for further detail operation!**
- Protocol Screen:**
  - Text area showing protocol logs:
 

```
>> 50 00 00 8C DC
<< 50 00 02 8C 01 05 DA ---success
>> 50 00 01 8D 05 D9
<< 50 00 07 8D 07 00 00 EE EE 10 00 CD ---success
>> 50 00 05 95 05 00 00 04 00 C1
<< 50 00 04 95 00 00 00 00 C1 ---success
```
  - Button: 'Clear'

### 2.8.10.7 Application Level-Write Data

To write data to Standard Data Files and Backup Data Files

Parameters to be operated:

File ID: the file number to be read from, ONE byte

Address: the starting position for the read operation , THREE byte, range from 0x00 00 00 to 0x FF FF FF

Length: the number of data bytes to be read, THREE byte, and range 0x00 00 00 to 0x FF FF FF

Data:

More details information, please refer to datasheet of using card accordingly

The screenshot shows the 'ApplicationLevel' software window. The 'File IDs' list contains '05'. The 'File ID' dropdown is set to '05'. The 'File Setting' section shows 'File ID' as '05', 'File Type' as '00', 'Communicate way' as '00', 'Access right' as 'EEEE', and 'File size' as '10 00 00'. The 'Standard DataFile & Backup File' section has 'File ID' as '00', 'Communicate way' as '00', 'Access right' as 'EE EE', and 'File size' as '00 00 00'. Below this, a 'NOTE: StdFile means to Standard Data File' is displayed. The 'File ID' dropdown is set to '05', 'Address' is '00 00', and 'Length' is '04 00'. The 'Data' field contains '00000000'. The 'Data' field is highlighted with a green box, and the 'Write Data' button is also highlighted. The 'Value File & Record File' section has a 'NOTE: Please click right side button for further detail operation!' and buttons for 'Value File' and 'Record File'. The 'Protocol Screen' at the bottom shows a list of commands and responses, including '50 00 02 8C 01 05 DA ---success' and '50 00 01 8D 05 D9'.

File IDs: 05

File ID: 05

Get FileID

Select File

**File Setting**

File ID: 05

File Type: 00 Communicate way: 00 Access right: EEEE File size: 10 00 00

Get File Setting

File ID: 05 Communicate way: 00 Access right: EE EE

Change File Setting

**Standard DataFile & Backup File**

File ID: 00 Communicate way: 00 Access right: EE EE File size: 00 00 00

Create StdFile

Create BackupFile

NOTE: StdFile means to Standard Data File

File ID: 05 Address: 00 00 Length: 04 00

Data: 00000000

Read Data

Data: 01020304 BackupFile Write Data

**Value File & Record File**

Value File

Record File

NOTE: Please click right side button for further detail operation!

**Protocol Screen**

```
<< 50 00 02 8C 01 05 DA ---success
>> 50 00 01 8D 05 D9
<< 50 00 07 8D 07 00 00 EE EE 10 00 CD ---success
>> 50 00 05 95 05 00 00 04 00 C1
<< 50 00 04 95 00 00 00 00 C1 ---success
>> 50 00 09 96 05 00 00 04 00 01 02 03 04 CA
<< 50 00 00 96 C6 ---success
```

Clear

## 2.8.11 Application Level-Value File

### 2.8.11.1 Value File -Create Value File

To create files or the storage and manipulation of 32bit signed integer value within an existing application on the PICC

More details information, please refer to datasheet of using card accordingly

The screenshot displays the 'ApplicationLevel' software interface, specifically the 'Value File' tab. The interface is divided into several sections:

- Value File Section:** This section contains input fields for 'File ID' (00), 'Communicate way' (00), 'Access right' (00 00), 'Limit Credit' (00), 'Lower Limit' (00 00 00 00), 'Upper Limit' (00 00 00 00), and 'Value' (00 00 00 00). A 'Create Value File' button is located to the right of these fields.
- File ID and Value Section:** Below the first section, there are fields for 'File ID' (00) and 'Value' (01 00 00 00), along with a 'Get Value' button.
- Transaction Section:** This section includes buttons for 'Credit', 'Debit', 'Commit Transaction', 'Absort Transaction', and 'Limit Credit'.
- Protocol Screen:** A large text area at the bottom displays the communication protocol. It shows a successful transaction:   
 >> 50 00 11 91 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 D0  
 << 50 00 00 91 C1 ---success  
 A 'Clear' button is located at the bottom right of this section.

### 2.8.11.2 Value File -Get Value

It allows to read the currently stored value from Value File

The screenshot displays the 'Value File' application window. The 'Value File' section contains several input fields and buttons. A red rectangle highlights the 'File ID' (00) and 'Value' (00 00 00 00) fields, along with the 'Get Value' button. Below this, another section shows 'File ID' (00) and 'Value' (01 00 00 00) with buttons for 'Credit', 'Debit', 'Commit Transaction', 'Absort Transaction', and 'Limit Credit'. The 'Protocol Screen' at the bottom shows a list of transactions, with a red rectangle highlighting the last two: '>> 50 00 01 97 00 C6' and '<< 50 00 04 97 00 00 00 C3 ---success'. A 'Clear' button is located at the bottom right of the protocol screen.

**Value File**

File ID: 00 Communicate way: 00 Access right: 00 00 Limit Credit: 00  
Lower Limit: 00 00 00 00 Upper Limit: 00 00 00 00 Value: 00 00 00 00 Create Value File  
File ID: 00 Value: 00 00 00 00 Get Value

File ID: 00 Value: 01 00 00 00 Credit Debit  
Commit Transaction Absort Transaction Limit Credit

**Protocol Screen**

```
>> 50 00 11 91 00 00 00 00 00 00 00 00 00 00 00 00 00 00 D0  
<< 50 00 00 91 C1 ---success  
>> 50 00 01 97 00 C6  
<< 50 00 04 97 00 00 00 00 C3 ---success
```

Clear

### 2.8.11.3 Value File-Transactions operation

The transactions are including:

**Credit:** increase a value stored in a Value File

**Debit:** decrease a value stored in a Value File

**Commit Transaction:** Validate all previous write access on Backup Data File, Value Files and Record Files within one application

**Abort Transaction:** invalidate all previous write access on Backup Data File, Value Files and Record Files within one application

**Limit Credit:** limited increase of a value in a Value File without having full Read&Write permission to the file

More details information, please refer to datasheet of using card accordingly

The screenshot displays the 'Value File' application window. It features a 'Value File' section with input fields for File ID, Communicate way, Access right, Limit Credit, Lower Limit, Upper Limit, and Value. Below these are buttons for 'Create Value File' and 'Get Value'. A red rectangular box highlights the transaction controls, which include input fields for File ID and Value, and buttons for 'Credit', 'Debit', 'Commit Transaction', 'Absort Transaction', and 'Limit Credit'. At the bottom of the window is a 'Protocol Screen' area with a 'Clear' button.

Field	Value
File ID	00
Communicate way	00
Access right	00 00
Limit Credit	00
Lower Limit	00 00 00 00
Upper Limit	00 00 00 00
Value	00 00 00 00
File ID (Transaction)	00
Value (Transaction)	01 00 00 00



## 2.8.12 Application Level- Record File

### 2.8.12.1 Record File-Create Linear/Cyclic Record File

This is used to create files for multiple storage of structural data, for example for logging transactions,

More details information, please refer to datasheet of using card accordingly

The screenshot displays the 'Record File' application window, which is divided into three main sections:

- Create/Clear Record File:** This section is highlighted with a red border. It contains input fields for 'File ID' (00), 'Communicate way' (00), 'Access right' (00 00), 'File size' (00 00 00), and 'Record Number' (00 00). To the right of these fields are three buttons: 'Create Linear Record File', 'Create Cyclic Record File', and 'Clear Record File'.
- Read Record:** This section contains input fields for 'File ID' (00), 'Record No.' (00 00), and 'Record Number' (00 00). Below these fields is a large text area for displaying record data. A 'Read Record' button is located at the bottom right of this section.
- Write Record:** This section contains input fields for 'File ID' (00) and 'Address' (00 00). Below these fields is a large text area for entering record data. A 'Write Record' button is located at the bottom right of this section.

At the bottom of the window is a section labeled 'Protocol Screen', which contains a large text area for displaying protocol data and a 'Clear' button at the bottom right.

### 2.8.12.2 Record File-Read Record

To read out a set of complete records from a Cyclic or Liner Record File

Parameters to be read:

File ID: the file number to be read from, ONE byte length

Record No: the offset of the newest record which is read out, THREE bytes long

Record Number: the number of records to be read from PICC

The screenshot displays the 'Record File' application window. It is divided into three main sections: 'Create/Clear Record File', 'Read Record', and 'Write Record'. The 'Read Record' section is highlighted with a red rectangular border. This section contains input fields for 'File ID' (00), 'Record No.' (00 00), and 'Record Number' (00 00), followed by a large empty text area and a 'Read Record' button. The 'Create/Clear Record File' section above it includes fields for 'File ID' (00), 'Communicate way' (00), 'Access right' (00 00), 'File size' (00 00 00), and 'Record Number' (00 00), with buttons for 'Create Linear Record File', 'Create Cyclic Record File', and 'Clear Record File'. The 'Write Record' section below it has fields for 'File ID' (00) and 'Address' (00 00), a large empty text area, and a 'Write Record' button. At the bottom is the 'Protocol Screen' section with a large empty text area and a 'Clear' button.

### 2.8.12.3 Record File-Write Record

To write data to a Cyclic or Liner Record File

Parameters to be read:

File ID: the file number to be read from and has to be range from 0x00 to 0x07, ONE byte length

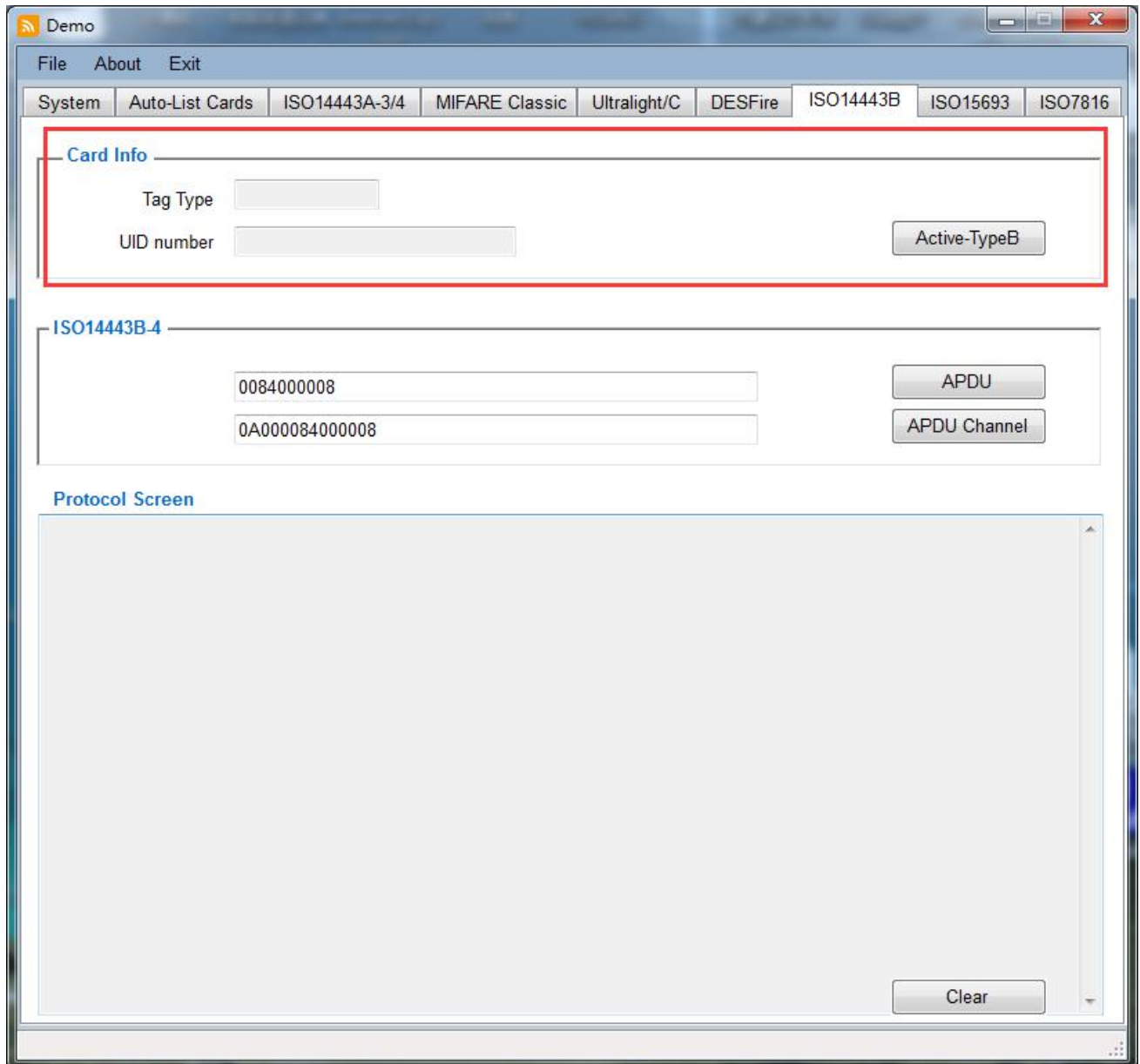
Address: the offset within one single record, and range from 0x00 00 00 00 to record size - 1

The screenshot displays the 'Record File' application window. It is divided into four main sections: 'Create/Clear Record File', 'Read Record', 'Write Record', and 'Protocol Screen'. The 'Write Record' section is highlighted with a red rectangular border. This section contains a 'File ID' input field with the value '00', an 'Address' input field with the value '00 00', a large empty text area for data entry, and a 'Write Record' button. The 'Read Record' section above it includes 'File ID' (00), 'Record No.' (00 00), 'Record Number' (00 00), a text area, and a 'Read Record' button. The 'Create/Clear Record File' section at the top has fields for 'File ID' (00), 'Communicate way' (00), 'Access right' (00 00), 'File size' (00 00 00), and 'Record Number' (00 00), along with buttons for 'Create Linear Record File', 'Create Cyclic Record File', and 'Clear Record File'. The 'Protocol Screen' at the bottom is a large empty area with a 'Clear' button in the bottom right corner.

## 2.9 ISO14443B

### 2.9.1 ISO14443B- Active-TypeB

To active ISO14443 Type B cards/tag



## 2.9.2 ISO14443B-4 APDU

The screenshot shows the 'Demo' application window with a menu bar (File, About, Exit) and a tabbed interface. The 'ISO14443B' tab is selected. The 'Card Info' section contains fields for 'Tag Type' and 'UID number', with an 'Active-TypeB' button. The 'ISO14443B-4' section contains two input fields: the top one has '0084000008' and is highlighted with a red rectangle, with an 'APDU' button to its right; the bottom one has '0A000084000008' and an 'APDU Channel' button to its right. The 'Protocol Screen' section is a large text area, currently empty, with a 'Clear' button at the bottom right.

Demo

File About Exit

System Auto-List Cards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire ISO14443B ISO15693 ISO7816

**Card Info**

Tag Type

UID number

Active-TypeB

**ISO14443B-4**

APDU

APDU Channel

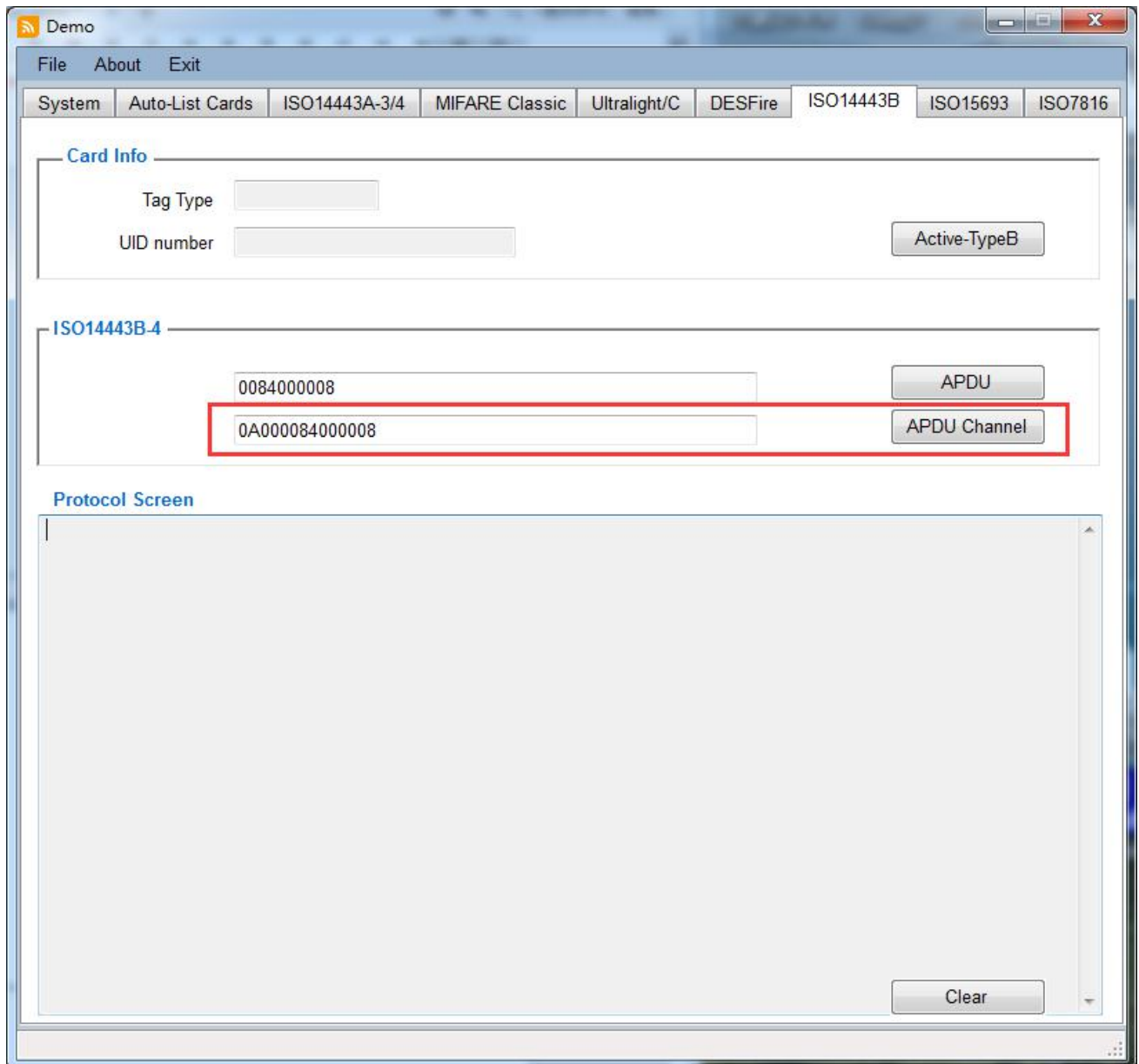
**Protocol Screen**

Clear

### 2.9.3 ISO14443B-4 APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands please refer to ISO14443B-4 Standard .





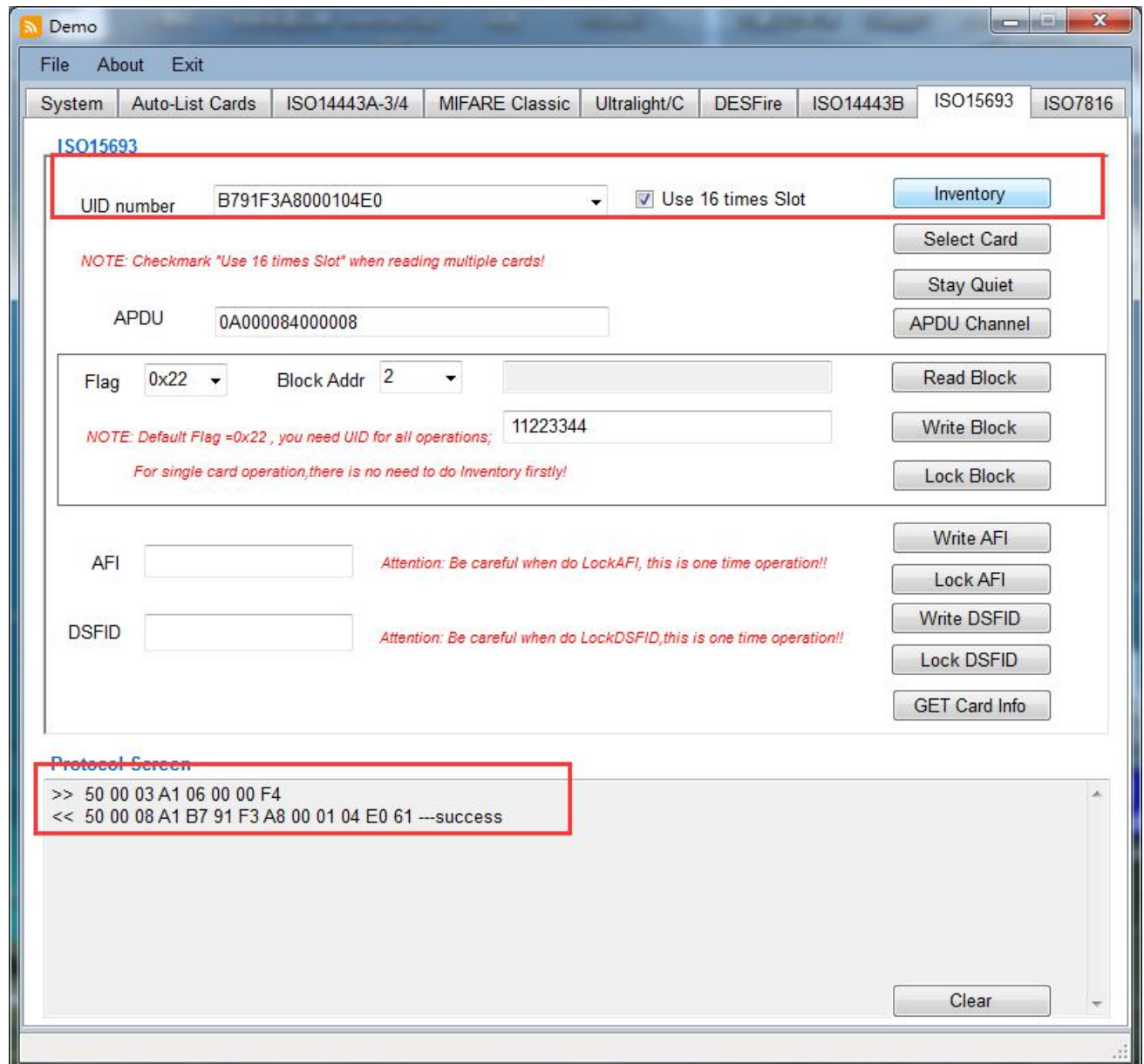
## 2.10 ISO15693

### 2.10.1 ISO15693-Inventory

To get the UID of ISO15693 standard cards/tags.

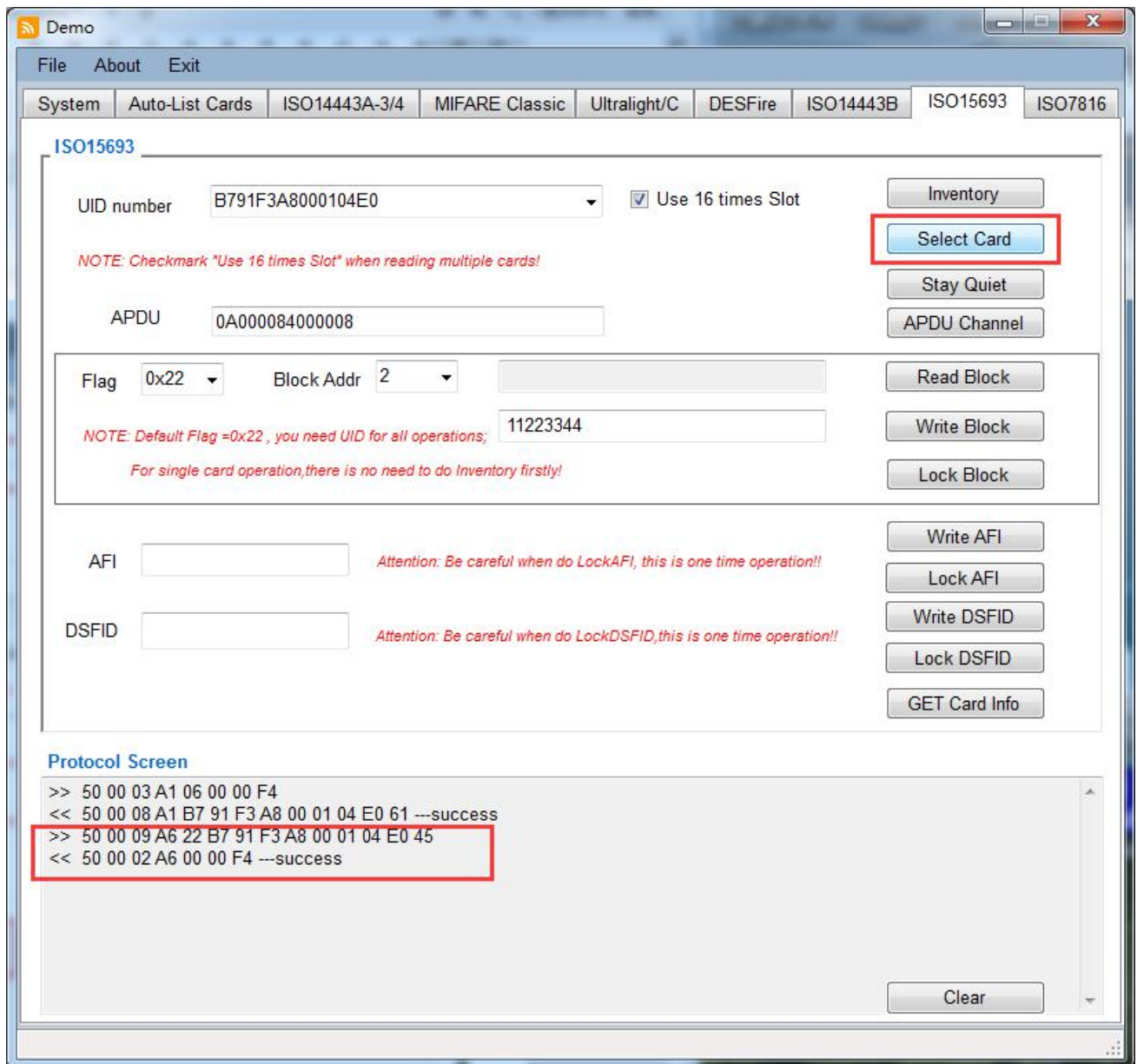
☒ Use 16 times Slot

When ☒ Use 16 times Slot is selected, it can be read multiple cards in one time, and the all UID numbers will be listing on leftside box.



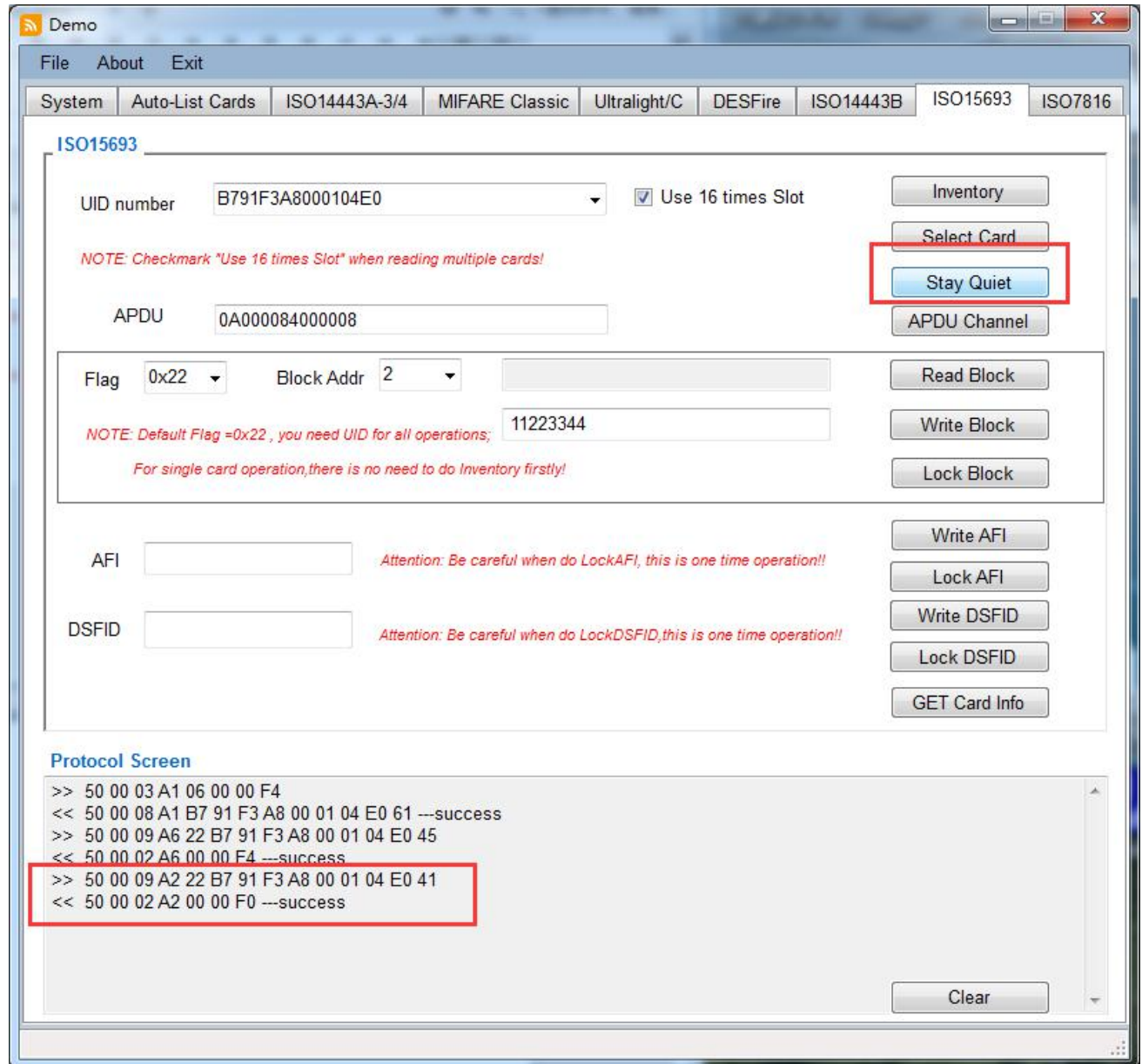
### 2.10.2 ISO15693-Select card

To select the card for further read/write operations, when there are multiple cards, please select the right one on UID number lists after inventory.



### 2.10.3 ISO15693-Stay Quiet

To make the card to be slept



#### 2.10.4 ISO15693-APDU

This is transfer channel to send any available commands to the card directly through RF chipset.

And The first CMD before transfer must be ISO15693\_Inventory, this will set the reader (or module) go into ISO15693 mode, Details commands please refer to ISO15693 Standard .

**ISO15693**

UID number: B791F3A8000104E0 ☒ Use 16 times Slot

*NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!*

APDU: 0A000084000008

Buttons: Inventory, Select Card, Stay Quiet, APDU Channel

Flag: 0x22 Block Addr: 2

*NOTE: Default Flag =0x22 , you need UID for all operations;*

*For single card operation,there is no need to do Inventory firstly!*

Buttons: Read Block, Write Block, Lock Block

AFI: *Attention: Be careful when do LockAFI, this is one time operation!!*

DSFID: *Attention: Be careful when do LockDSFID,this is one time operation!!*

Buttons: Write AFI, Lock AFI, Write DSFID, Lock DSFID, GET Card Info

**Protocol Screen**

```
>> 50 00 03 A1 06 00 00 F4
<< 50 00 08 A1 B7 91 F3 A8 00 01 04 E0 61 ---success
>> 50 00 09 A6 22 B7 91 F3 A8 00 01 04 E0 45
<< 50 00 02 A6 00 00 F4 ---success
```

Clear

### 2.10.5 ISO15693-Read Block

To read the data in specific block address

Parameters to be optional:

Flag: 0x22 or 0x02, refer to datasheet of using card

Block Addr: the block address to be read

**ISO15693**

UID number: B791F3A8000104E0 ☒ Use 16 times Slot

NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!

APDU: 0A0000840000008

Flag: 0x22 Block Addr: 2 00000000 **Read Block**

NOTE: Default Flag =0x22, you need UID for all operations; 11223344

For single card operation, there is no need to do Inventory firstly!

AFI:  Attention: Be careful when do LockAFI, this is one time operation!!

DSFID:  Attention: Be careful when do LockDSFID, this is one time operation!!

Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info

**Protocol Screen**

```
>> 50 00 03 A1 06 00 00 F4
<< 50 00 08 A1 B7 91 F3 A8 00 01 04 E0 61 ---success
>> 50 00 09 A6 22 B7 91 F3 A8 00 01 04 E0 45
<< 50 00 02 A6 00 00 F4 ---success
>> 50 00 0B A3 22 02 01 B7 91 F3 A8 00 01 04 E0 41
<< 50 00 06 A3 00 00 00 00 00 00 F5 ---success
```

Clear



### 2.10.6 ISO15693-Write Block

To write data into specific block address

Parameters to be optional:

Flag: 0x22 or 0x02, refer to datasheet of using card

Block Addr: the block address to be written, 4byte length

**ISO15693**

UID number: B791F3A8000104E0 ☒ Use 16 times Slot

*NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!*

APDU: 0A0000840000008

Flag: 0x22 Block Addr: 2

00000000

11223344

*NOTE: Default Flag =0x22, you need UID for all operations;*

*For single card operation, there is no need to do Inventory firstly!*

Buttons: Inventory, Select Card, Stay Quiet, APDU Channel, Read Block, Write Block, Lock Block, Write AFI, Lock AFI, Write DSFID, Lock DSFID, GET Card Info

**Protocol Screen**

```
>> 50 00 03 A1 06 00 00 F4
<< 50 00 08 A1 B7 91 F3 A8 00 01 04 E0 61 ---success
>> 50 00 09 A6 22 B7 91 F3 A8 00 01 04 E0 45
<< 50 00 02 A6 00 00 F4 ---success
>> 50 00 0B A3 22 02 01 B7 91 F3 A8 00 01 04 E0 41
<< 50 00 06 A3 00 00 00 00 00 00 F5 ---success
>> 50 00 0A A5 22 02 B7 91 F3 A8 00 01 04 E0 47
<< 50 00 02 A5 00 00 F7 ---success
```

Clear

### 2.10.7 ISO15693-Lock Block

To lock the specific block address

Parameters to be optional:

Flag: 0x22 or 0x02, refer to datasheet of using card

Block Addr: the block address to be locked

The screenshot shows a software window titled "Demo" with a menu bar (File, About, Exit) and a tabbed interface. The "ISO15693" tab is selected. The interface includes the following elements:

- System Tabs:** System, Auto-List Cards, ISO14443A-3/4, MIFARE Classic, Ultralight/C, DESFire, ISO14443B, ISO15693 (selected), ISO7816.
- ISO15693 Section:**
  - UID number:** B791F3A8000104E0 (dropdown menu).
  - Use 16 times Slot:** ☒ (checkbox).
  - Inventory:** Button.
  - Select Card:** Button.
  - Stay Quiet:** Button.
  - APDU Channel:** Button.
  - APDU:** 0A0000840000008 (text field).
  - Flag:** 0x22 (dropdown menu, highlighted with a red box).
  - Block Addr:** 2 (dropdown menu, highlighted with a red box).
  - 00000000:** Text field.
  - 11223344:** Text field.
  - Read Block:** Button.
  - Write Block:** Button.
  - Lock Block:** Button (highlighted with a red box).
  - NOTE:** Checkmark "Use 16 times Slot" when reading multiple cards!
  - NOTE:** Default Flag =0x22 , you need UID for all operations;
  - NOTE:** For single card operation, there is no need to do Inventory firstly!
- AFI:** Text field. **Attention:** Be careful when do LockAFI, this is one time operation!!
- DSFID:** Text field. **Attention:** Be careful when do LockDSFID, this is one time operation!!
- Buttons:** Write AFI, Lock AFI, Write DSFID, Lock DSFID, GET Card Info.

**Protocol Screen:** A large text area for displaying protocol details, with a "Clear" button at the bottom right.

### 2.10.8 ISO15693-Write AFI

AFI=Application Family Identifier, which it's a 8-bit value and located at Byte 2 in Block -2 ,and it allows for example the creation of label families.

For details please refer to ISO 15693-3.

Demo

File About Exit

System Auto-List Cards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire ISO14443B ISO15693 ISO7816

**ISO15693**

UID number B791F3A8000104E0 ☒ Use 16 times Slot Inventory

*NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!*

APDU 0A000084000008 Select Card

Stay Quiet

APDU Channel

Flag 0x22 Block Addr 2 00000000 Read Block

*NOTE: Default Flag =0x22 , you need UID for all operations;* 11223344 Write Block

*For single card operation,there is no need to do Inventory firstly!* Lock Block

AFI  *Attention: Be careful when do LockAFI, this is one time operation!!* Write AFI

Lock AFI

DSFID  *Attention: Be careful when do LockDSFID,this is one time operation!!* Write DSFID

Lock DSFID

GET Card Info

**Protocol Screen**

Clear

### 2.10.9 ISO15693-Lock AFI

For details please refer to ISO/IEC 15693-3.

The screenshot shows the 'Demo' application window with the 'ISO15693' protocol selected. The interface includes a menu bar (File, About, Exit) and a tabbed interface with tabs for System, Auto-List Cards, ISO14443A-3/4, MIFARE Classic, Ultralight/C, DESFire, ISO14443B, ISO15693, and ISO7816. The 'ISO15693' tab is active, displaying various configuration fields and buttons.

**ISO15693 Configuration:**

- UID number:** B791F3A8000104E0 (dropdown menu)
- Use 16 times Slot:** ☒ (checkbox)
- APDU:** 0A000084000008 (text input)
- Flag:** 0x22 (dropdown menu)
- Block Addr:** 2 (dropdown menu)
- Block Data:** 00000000 (text input)
- Block Data:** 11223344 (text input)

**Buttons:** Inventory, Select Card, Stay Quiet, APDU Channel, Read Block, Write Block, Lock Block, Write AFI, Lock AFI, Write DSFID, Lock DSFID, GET Card Info.

**Notes:**

- NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!*
- NOTE: Default Flag =0x22 , you need UID for all operations;*
- For single card operation,there is no need to do Inventory firstly!*
- Attention: Be careful when do LockAFI, this is one time operation!!*
- Attention: Be careful when do LockDSFID,this is one time operation!!*

**Protocol Screen:**

A large text area for displaying protocol details, with a 'Clear' button at the bottom right.

### 2.10.10 ISO15693-Write DSFID

DSFID= Data Storage Format Identifier, which is located at Byte 3 in Block -2.

For details please refer to ISO/IEC 15693-3.

The screenshot shows the 'Demo' application window with the 'ISO15693' tab selected. The interface includes a menu bar (File, About, Exit) and a tabbed control panel. The 'ISO15693' section contains the following fields and controls:

- UID number:** A dropdown menu showing 'B791F3A8000104E0'. A checkbox labeled 'Use 16 times Slot' is checked.
- APDU:** A text input field containing '0A0000840000008'.
- Flag:** A dropdown menu showing '0x22'.
- Block Addr:** A dropdown menu showing '2'.
- 00000000:** A text input field.
- 11223344:** A text input field.
- AFI:** A text input field.
- DSFID:** A text input field, highlighted with a green border.

Buttons on the right side of the interface include: Inventory, Select Card, Stay Quiet, APDU Channel, Read Block, Write Block, Lock Block, Write AFI, Lock AFI, Write DSFID (highlighted with a blue border), Lock DSFID, and GET Card Info.

Notes displayed in red text:

- NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!*
- NOTE: Default Flag =0x22 , you need UID for all operations;*
- For single card operation,there is no need to do Inventory firstly!*
- Attention: Be careful when do LockAFI, this is one time operation!!*
- Attention: Be careful when do LockDSFID,this is one time operation!!*

At the bottom, there is a 'Protocol Screen' section with a large text area and a 'Clear' button.

### 2.10.11 ISO15693-Lock DSFID

For details please refer to ISO/IEC 15693-3.

**ISO15693**

UID number: B791F3A8000104E0 ☒ Use 16 times Slot

*NOTE: Checkmark "Use 16 times Slot" when reading multiple cards!*

APDU: 0A000084000008

Flag: 0x22 Block Addr: 2 00000000

*NOTE: Default Flag =0x22 , you need UID for all operations;*

*For single card operation,there is no need to do Inventory firstly!*

AFI:  *Attention: Be careful when do LockAFI, this is one time operation!!*

DSFID:  *Attention: Be careful when do LockDSFID,this is one time operation!!*

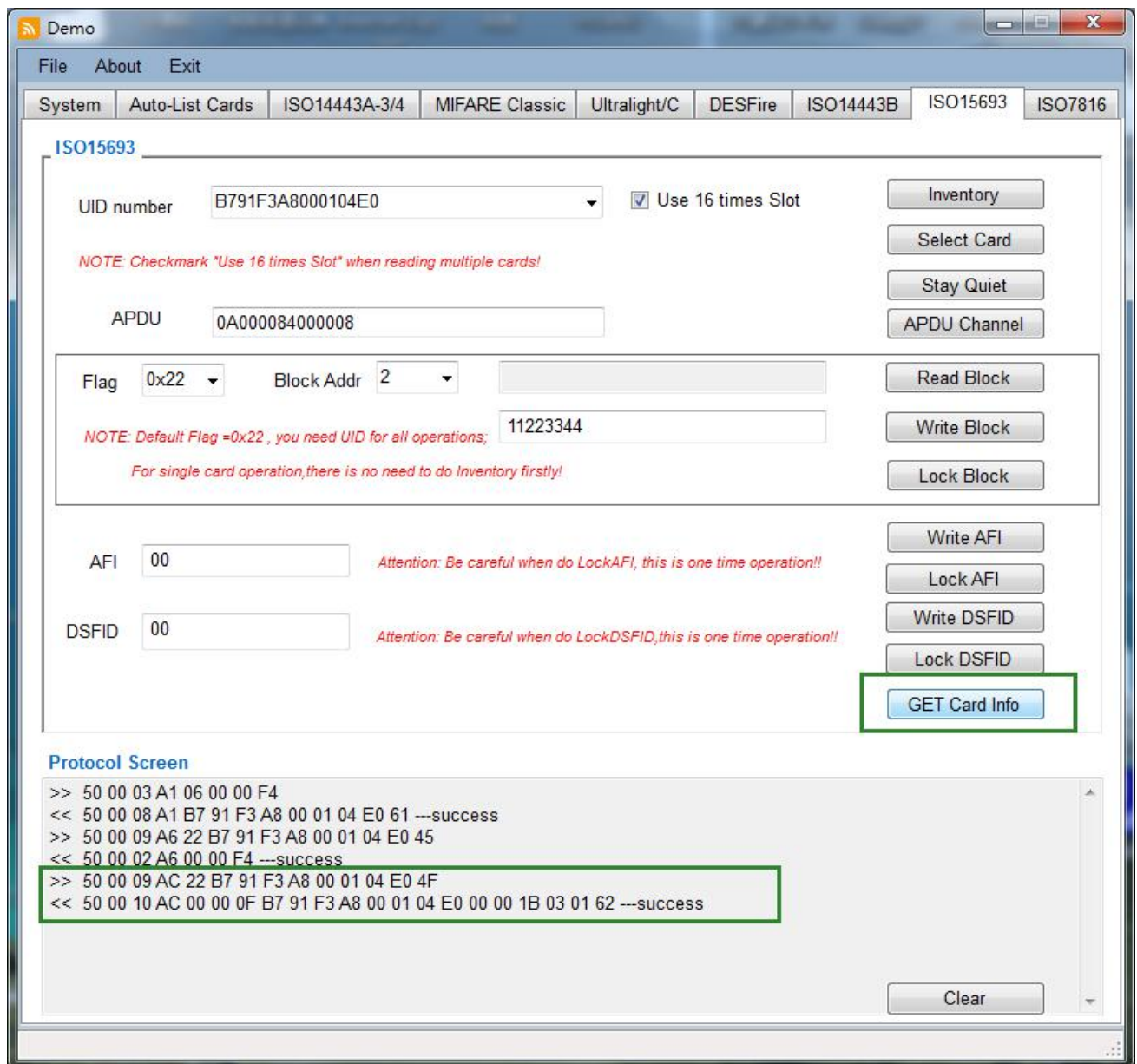
Buttons: Inventory, Select Card, Stay Quiet, APDU Channel, Read Block, Write Block, Lock Block, Write AFI, Lock AFI, Write DSFID, Lock DSFID, GET Card Info

**Protocol Screen**

Clear



### 2.10.12 ISO15693-Get Card Info



Other functions not on above listing or any other specific request about our device, please contact our sales person or technical engineers for support, THANK YOU.

Contact information:

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