RD200/300 TOOL
OPERATION MANUAL

V02.24

Model description

Model	Picture	Difference description
RD200-M1		HF RFID Desktop Reader Frequency: 13.56 MHz Support tag: ISO-14443A / Mifare Ultralight / NTAG203
RD200-LF		LF RFID Desktop Reader Frequency: 125 KHz Support tag: EM4100 compatible class / SYRIS/ FDX-B(ISO11784)
RD200-U1		UHF RFID Desktop Reader Frequency: 860~960MHz Support tag: Compatible with EPC Class 1 Gen 2;ISO-18000-6C
RD300-H1		HF RFID Desktop Reader Frequency: 13.56 MHz Support tag: ISO15693 / ISO14443A(Mifare) / ISO14443B / DESFire / NTAG203
RD300-FH1		HF RFID and Fingerprint Desktop Reader High accuracy and high recognition speed Optical Fingerprint Sensor Frequency: 13.56 MHz Support tag: ISO15693 / ISO14443A(Mifare) / ISO14443B / DESFire / NTAG203
RD300-L1		LF RFID Desktop Reader Frequency: 125 KHz Support tag: EM4100 compatible class / SYRIS/ FDX-B(ISO11784)
RD300-FL1		LF RFID and Fingerprint Desktop Reader High accuracy and high recognition speed Optical Fingerprint Sensor Frequency: 125 KHz Support tag: EM4100 compatible class / SYRIS/ FDX-B(ISO11784)

RD300-DES1		DESFire Reader Frequency: 13.56 MHz Support tag: DESFire full function with tools

Installation

The default setting of USB Mode is **USB Keyboard Emulation**. This Keyboard mode would send an "Enter" signal when read the card. If user let cursor focus on "Set" button and read the card that will press the "Set" button at the same time.

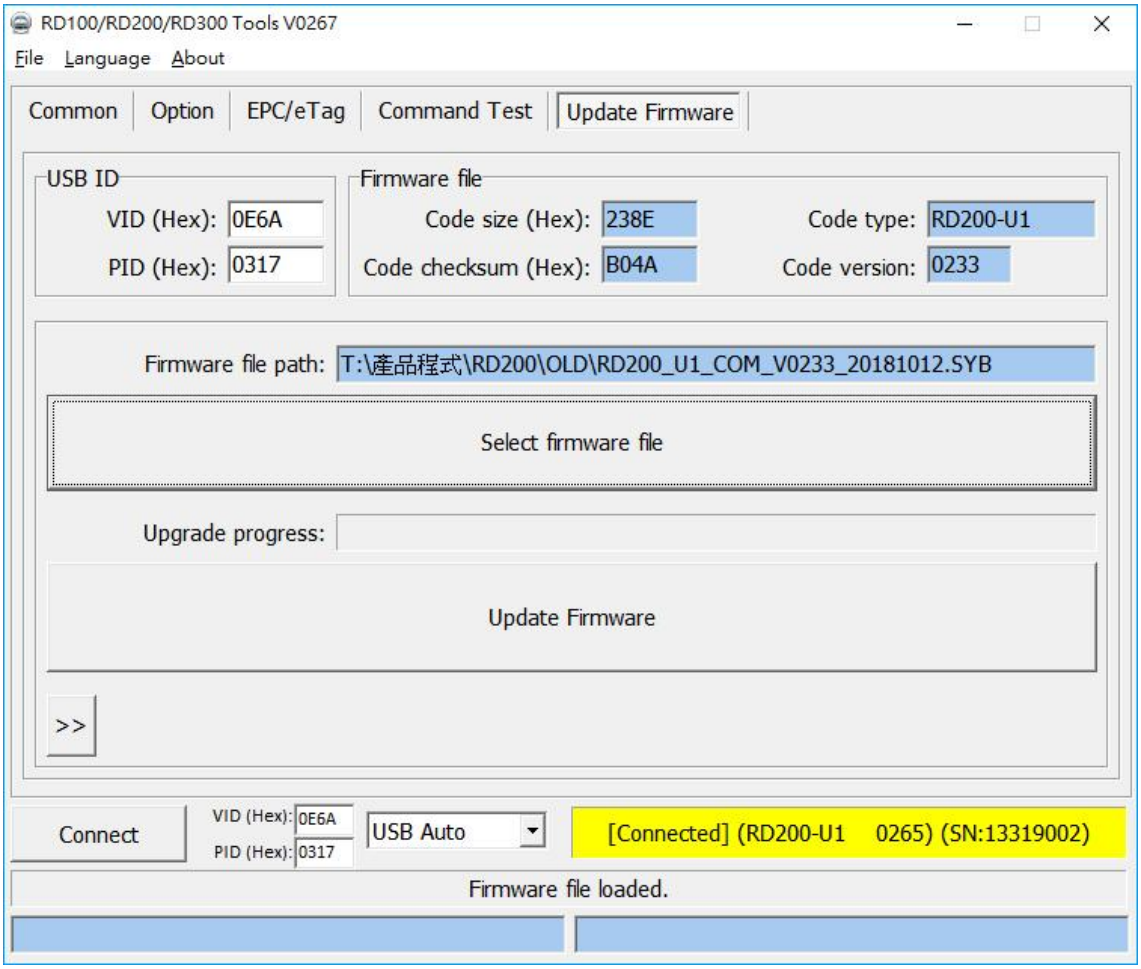
Driver installation (For change to virtual COM port mode)

1. Follow firmware update procedure to change virtual COM port mode firmware.

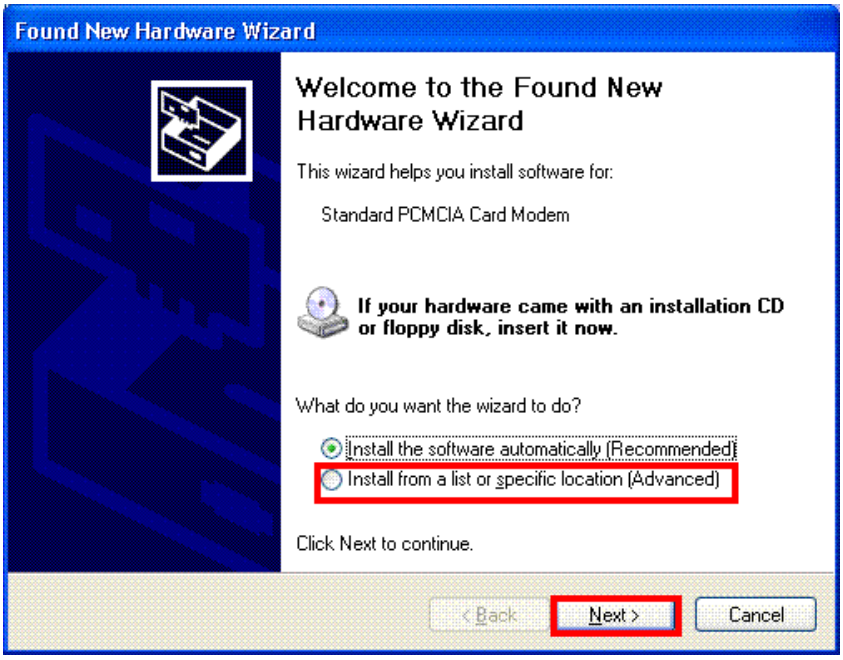
   (ex. RD200_U1_COM_V0191_20150316.SYB)

2. Update virtual COM port mode firmware with RD200/300 tools

   (SYRIS_RFID_DVD\RD200\RD200_RD300_SDK_V0192\UtilityTools\FirmwareFiles\)



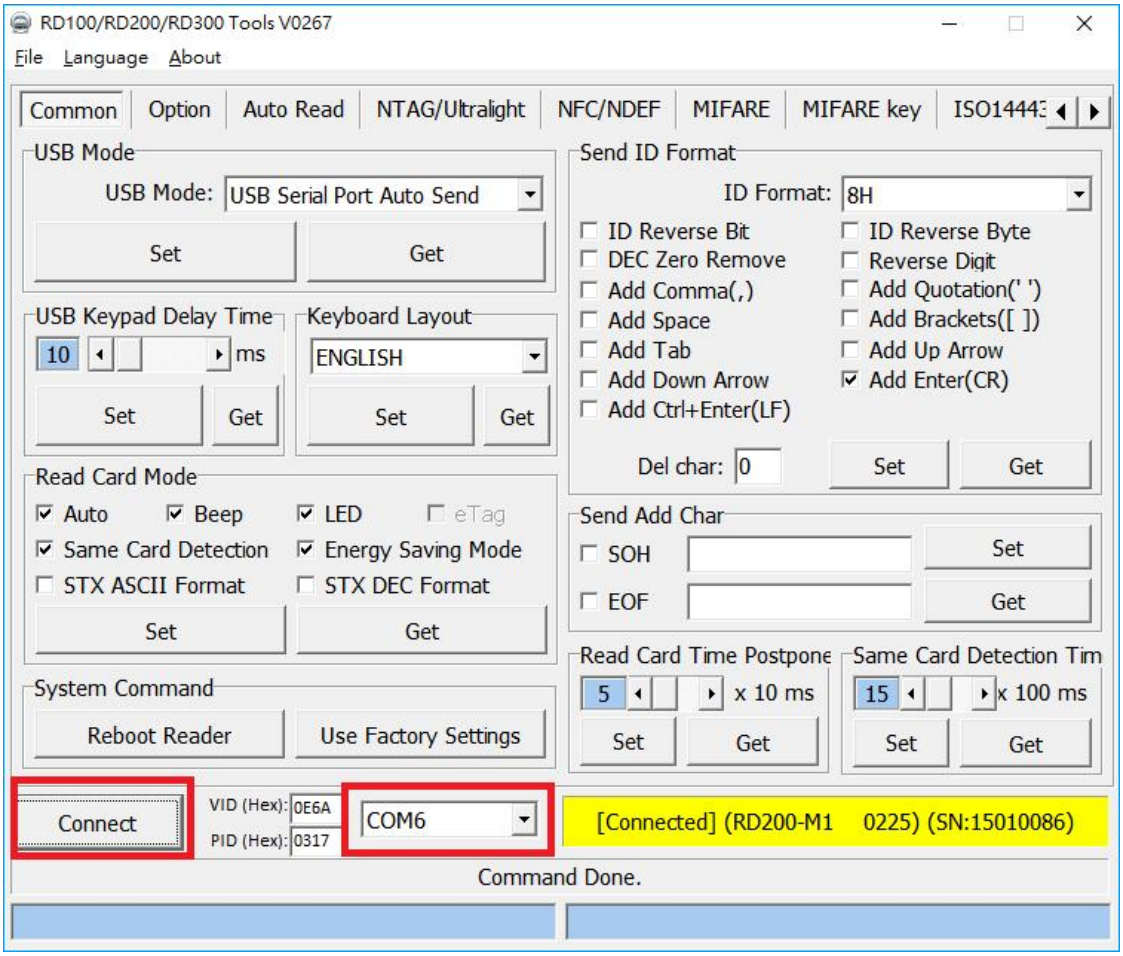
3. Connect RD200/RD300, system will automatically pop-up the "Found New Hardware Wizard" window for install the driver.



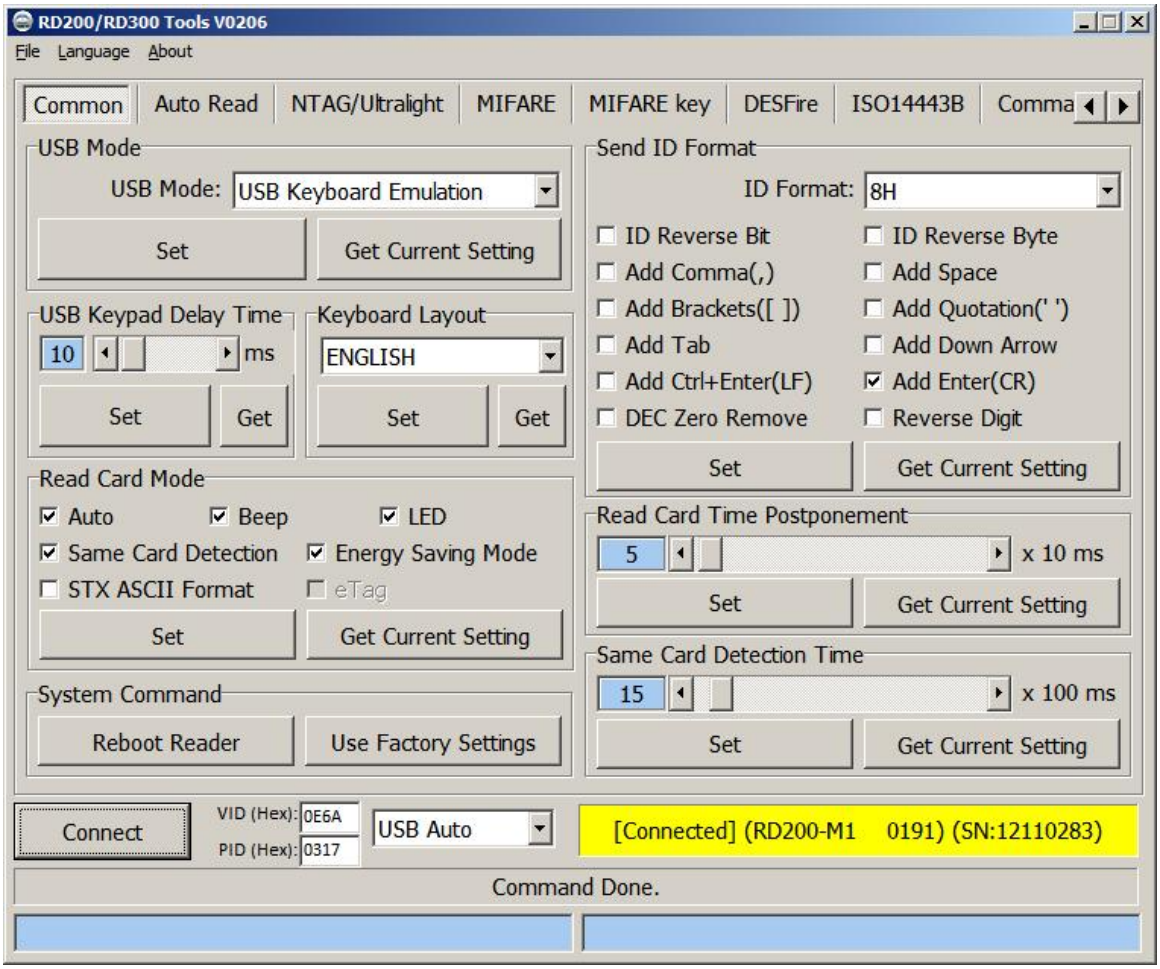
4. Allocate the driver folder, and then complete the installation.

(SYRIS_RFID_DVD\RD200\Driver)

5. Connect reader with COM port mode.

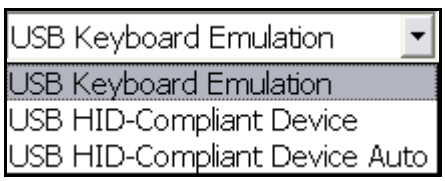


Common Setting



1. USB Mode

There are three selections of USB modes in "USB auto" connection, after selected the mode then click Set to finish the setting procedure, or click Get Current Setting to read current setting from the reader.



USB Keyboard Emulation：

The device can emulate keyboard to send character or string to host terminal.

2. **USB HID-Compliant Device：**

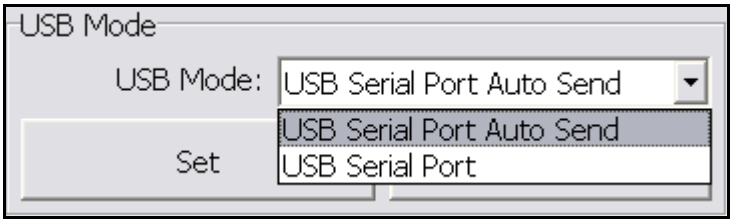
Device response data when received protocol command, and the data will be queued in device buffer.

USB HID-Compliant Device Auto Send：

The device sends UID to host terminal after read card.

3. **Virtual COM Port mode (Need update firmware)**

There are two selections of USB modes in "COM x" connection.



USB Serial Port Auto Send：

The device send UID to host terminal after read card.

USB Serial Port：

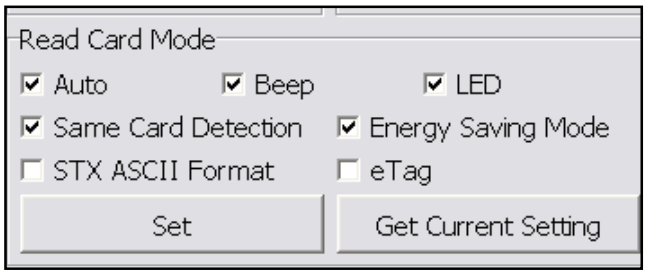
Device response data when received protocol command, and the data will be queued in device buffer.

4. **USB Keypad Delay Time**

In this mode, you can set keypad delay timing to reduce the key code sending speed when read tag.

5. Read Card Mode

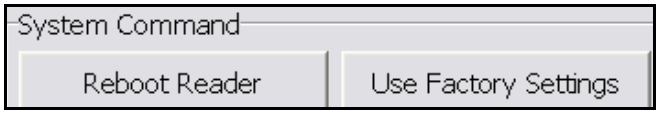
In this mode, program provided different options for user to choose, after ticked the options, just click Set to finish the setting procedure, or click Get Current Setting to read current setting from the reader.



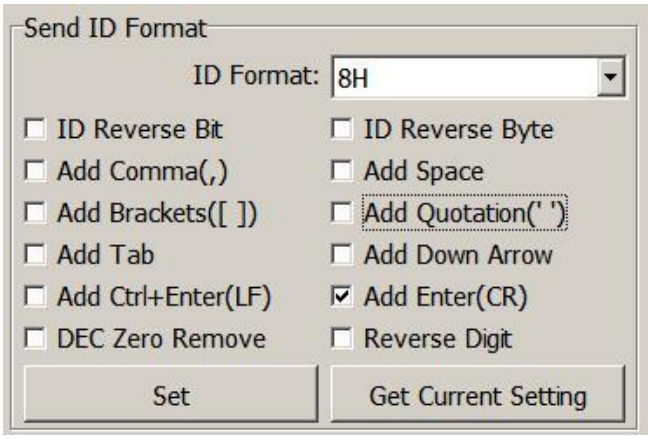
Options	Descriptions
Auto	Automatically read card
Beep	Prompt the beep sound or not.
LED	Flash the LED when read the card.
Same Card Detection	If continuously read the same card, user has to wait around 1.5 sec then could read again.
Energy Saving Mode	Provide more energy saving method. (It is not recommend to use in writing card blocks or several cards)
eTag	Read Taiwan ETC eTag format.

6. System Command

This tool provides two system commands; user can use Reboot Reader to reboot the RD200 reader. The other command is Use Factory Default Settings which can restore the reader settings to initial settings.



7. Send ID Format



This tool provide many ID format to choose, such as 4~16 numbers of hexadecimal and 4~13 numbers of decimal.

Also can put comma, space…etc. into the ID format, after ticked the items then click Set to finish the setting procedure, or click Get Current Setting to read current setting from the reader.

The ID format example as below:

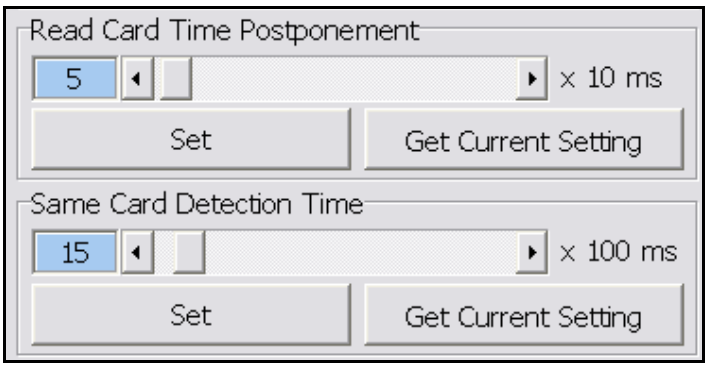
ID Format	Example Result
4H	58E8
6H	D558E8
8H	00D558E8
10H	1800D558E8
16H	0000001800D558E8
32H	00000000000000000000001800D558E8
5D	47295
8D	01226943
10D	0001226943
13D	0098785474751
4D	6493
FDX (LF only)	000000001226943
16H + Card ID Reverse	E858D50018000000
16H + Comma	0000001800D558E8,
16H + Brackets	[0000001800D558E8]
4D + Space	1928 1928
16H + Quotation	'0000001800D558E8'

8. Read Card Time Postponement / Same Card Detection Time

Read Card Time Postponement: The intermission time of card reading.

Same Card Detection Time: The intermission time of same card detection.

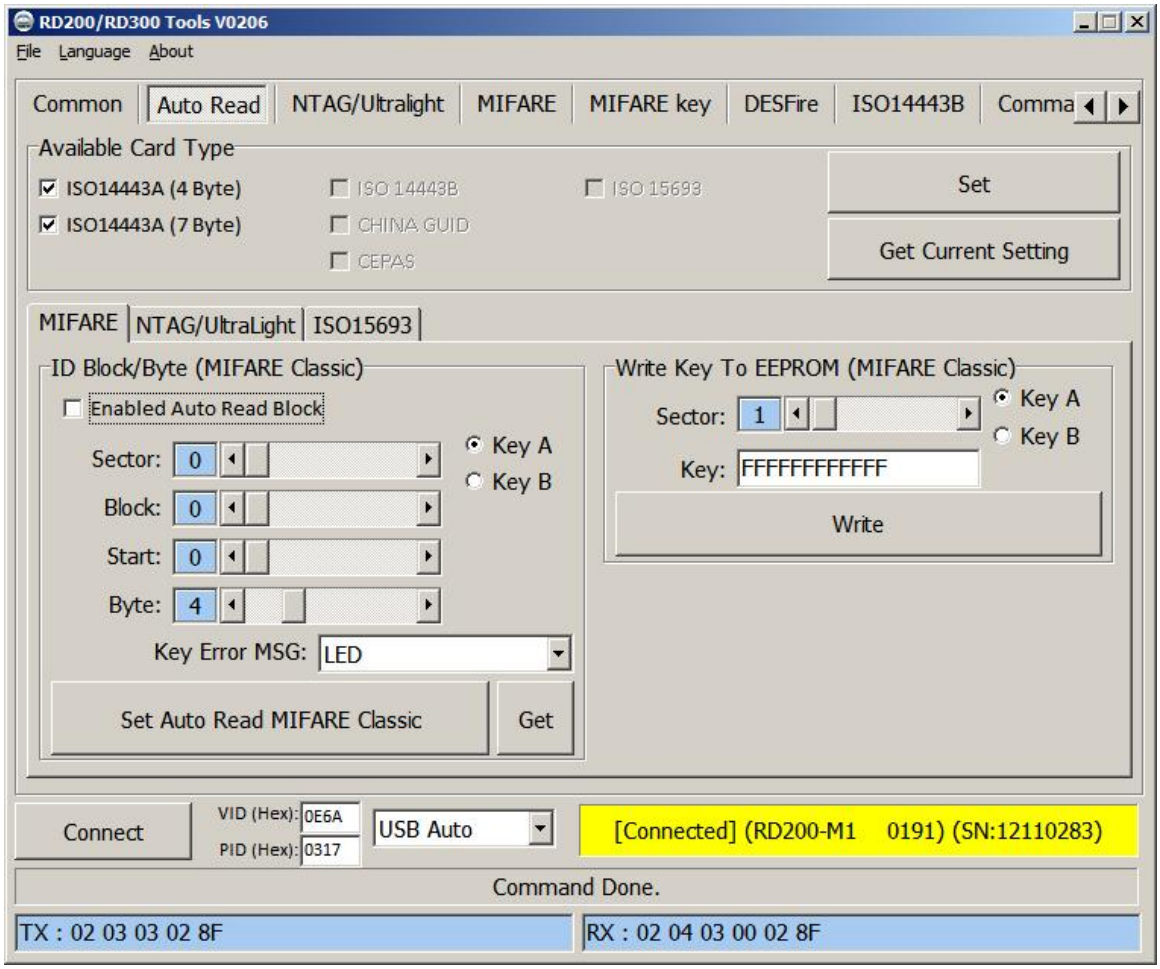
After adjusted the time then click Set to finish the setting procedure, or click Get Current Setting to read current setting from the reader.



Auto Read (RD200-M1, RD300-H series supported)

- Available card type: Setup read card type.
- Set auto read Mifare Class or Ultralight in this tab to read specific block automatically.

    1. Enable and select correct block.
    2. Click set auto read.
    3. Reader will always read selected block automatically.

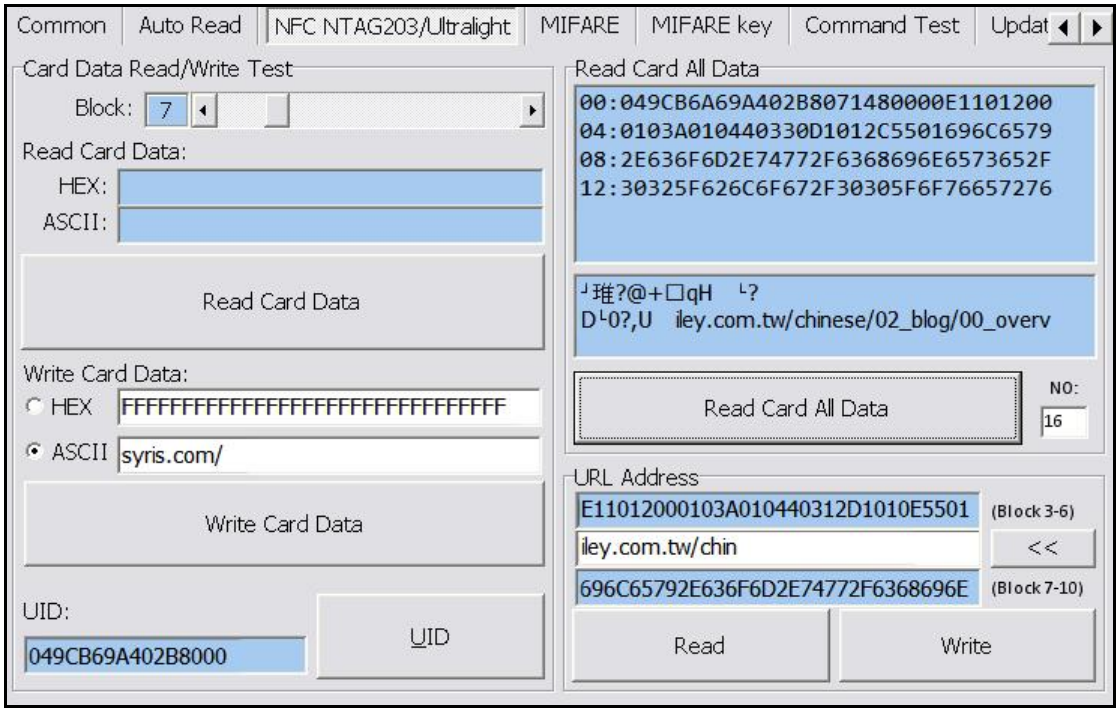


- Write Key to EEPROM: Save Mifare key to reader.

NTAG/Ultralight (RD200-M1, RD300-H series supported)

1. Read Card Data: Select correct block to read NFC tag's data.
2. Write Card Data: Select correct block to write NFC tag's data.

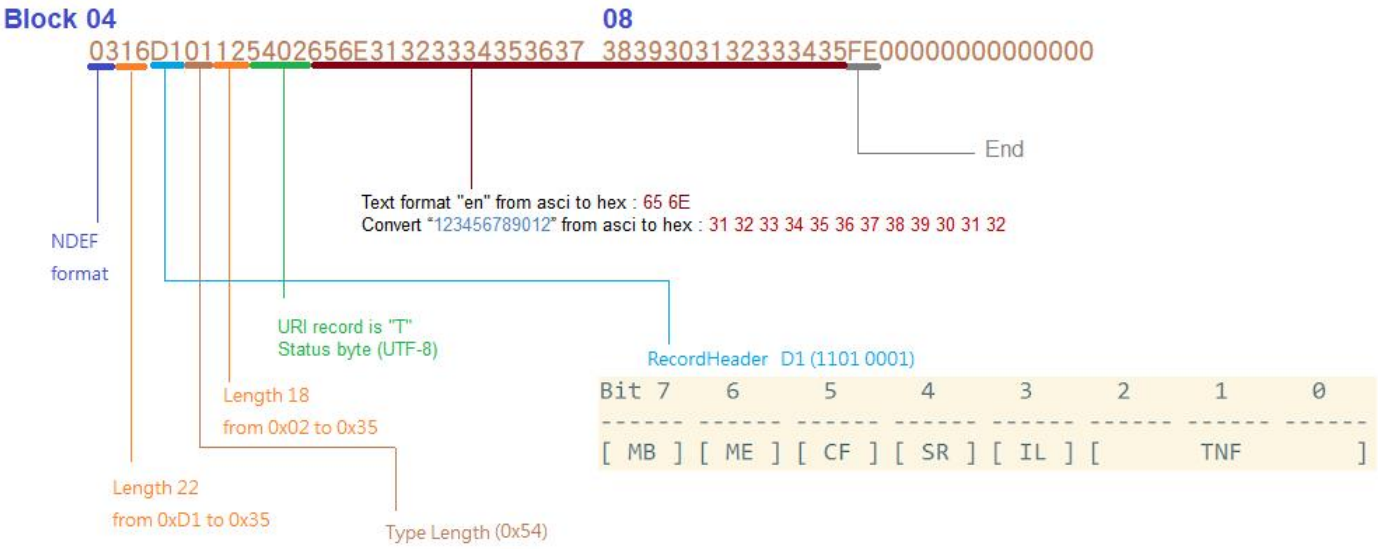
   (Recommend select HEX code to write.)
3. UID : Read tag's UID
4. Read Card All Data: Input max block number in "NO" and start to read all data.
5. URL address: This is a simple demo to read/write URL to tag.



For example.

Write a TEXT “123456789012” to NTAG with NDEF format.

Convert “123456789012” from asci to hex : 31 32 33 34 35 36 37 38 39 30 31 32



You need write multi-blocks with RD200 tool as blow.

Block 04~07 : 0316D101 12540265 6E313233 34353637

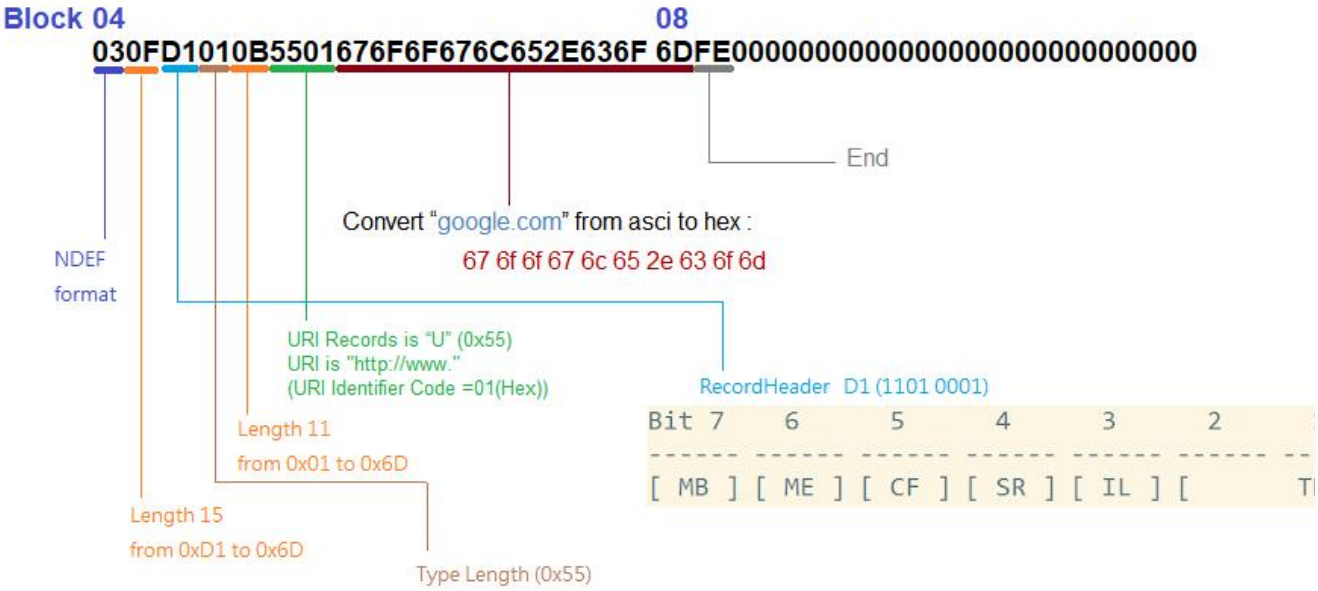
Block 08~11 : 38393031 32333435 FE000000 00000000

Write a URL “www.google.com” to NTAG with NDEF format.

Convert “google.com” from asci to hex : 67 6f 6f 67 6c 65 2e 63 6f 6d

URI Records is “U” (0x55) (Well-known NDEF Record Types)

URI is "http://" (URI Identifier Code =03(Hex))



You need write multi-blocks with RD200 tool as blow.

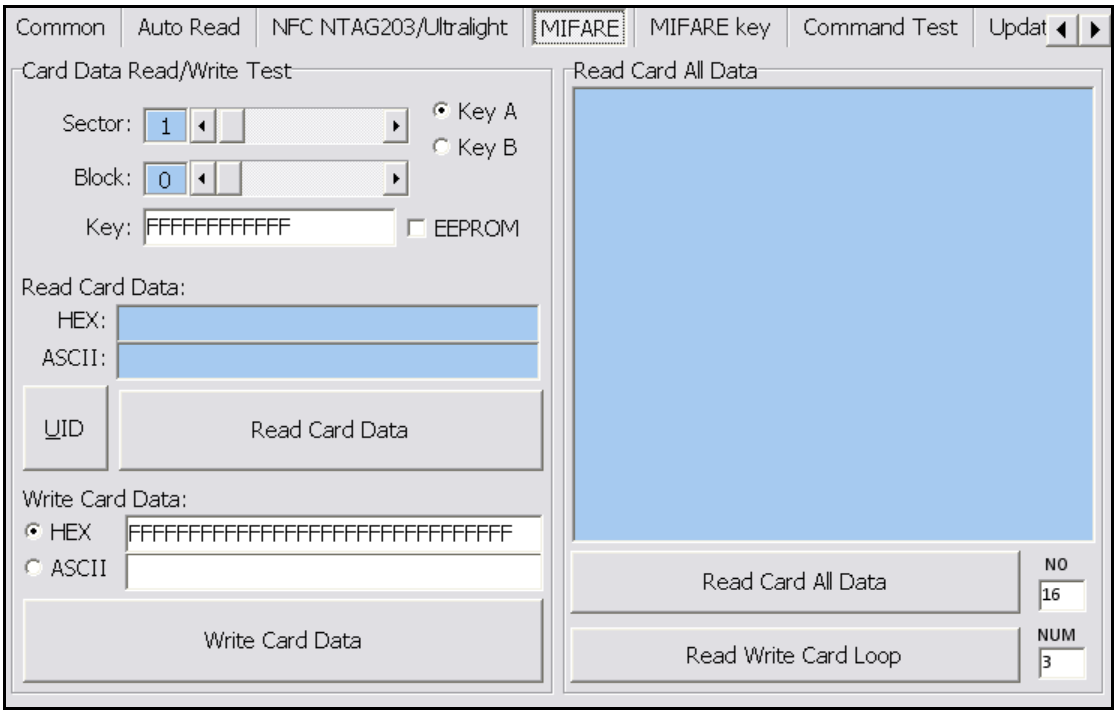
Block 04~07 : 030FD1010B550167 6F6F676C652E636F

Block 08~11 : 6DFE000000000000 0000000000000000

MIFARE (RD200-M1, RD300-H series supported)

※Please set the MIFARE Key before you change the Key in EEPROM.

The following sections will describe the different functions as below.



1. Card Data Read/Write Test

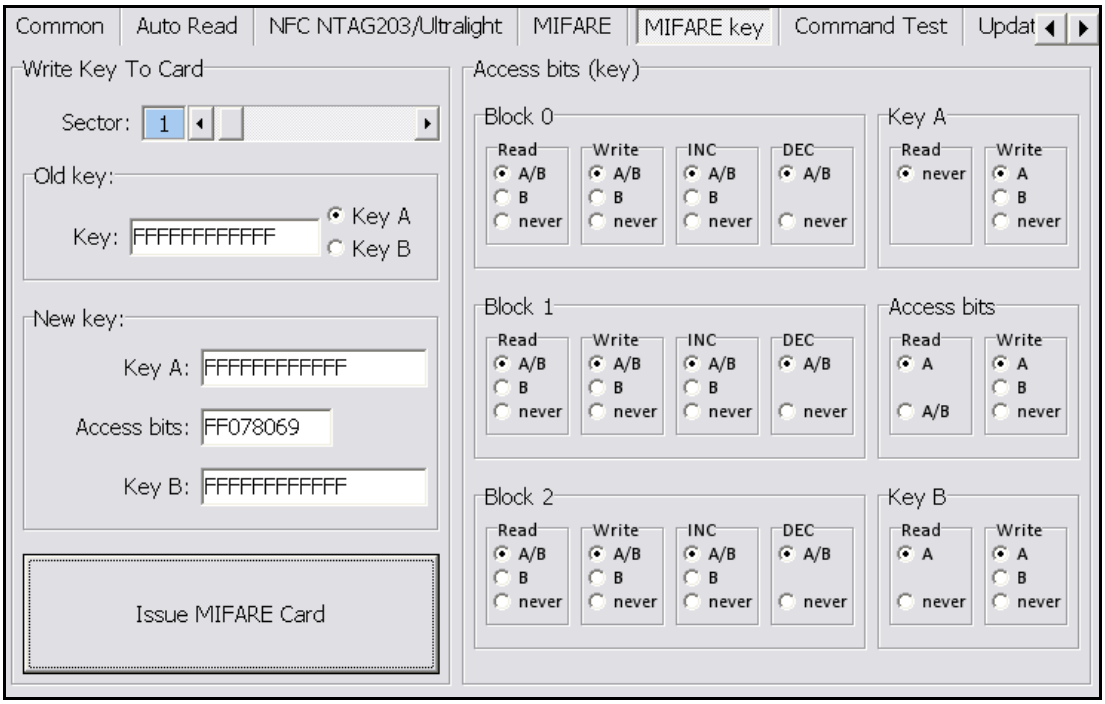
When user intend to read/write the card data that could tick the "EEPROM" to use the "Key" in the EEPROM (the prerequisite is the "Key" must has been stored in EEPROM already) or manually input the Key value for verifying.

Then select correct block and fill out the Read or Write Card Data field and click UID 、 Read Card Data or Write Card Data to finish the read/write action.

2. Read Card All Data

Click Read Card All Data or Read Card All Data Loop to read card data.

MIFARE Key



1. **Write KEY to Card**

User can write key value to card, the steps as below:

1. Allocate a Sector
2. Input Old key value and select Key A or B
3. Input New Key A or Key B value
4. Click Issue MIFARE Card to update the Key value.

Note 1: "Access bits" value will auto-compute by the program.

Note 2: The Old key must be correct otherwise the program will shows up an error message.

Note 3: The default value of Key A and Key B are "FFFFFFFFFFFF"

Note 4: The access bits control the rights of memory access using the secret keys A and B.

Note 5: Please use Key A to change Key B at first time.

2. Access bits (KEY)

User can set the verifying conditions for read/write or other actions.

Read: Read block.

Write: Write block.

INC: Add transfer restore.

DEC: Subtract transfer restore.

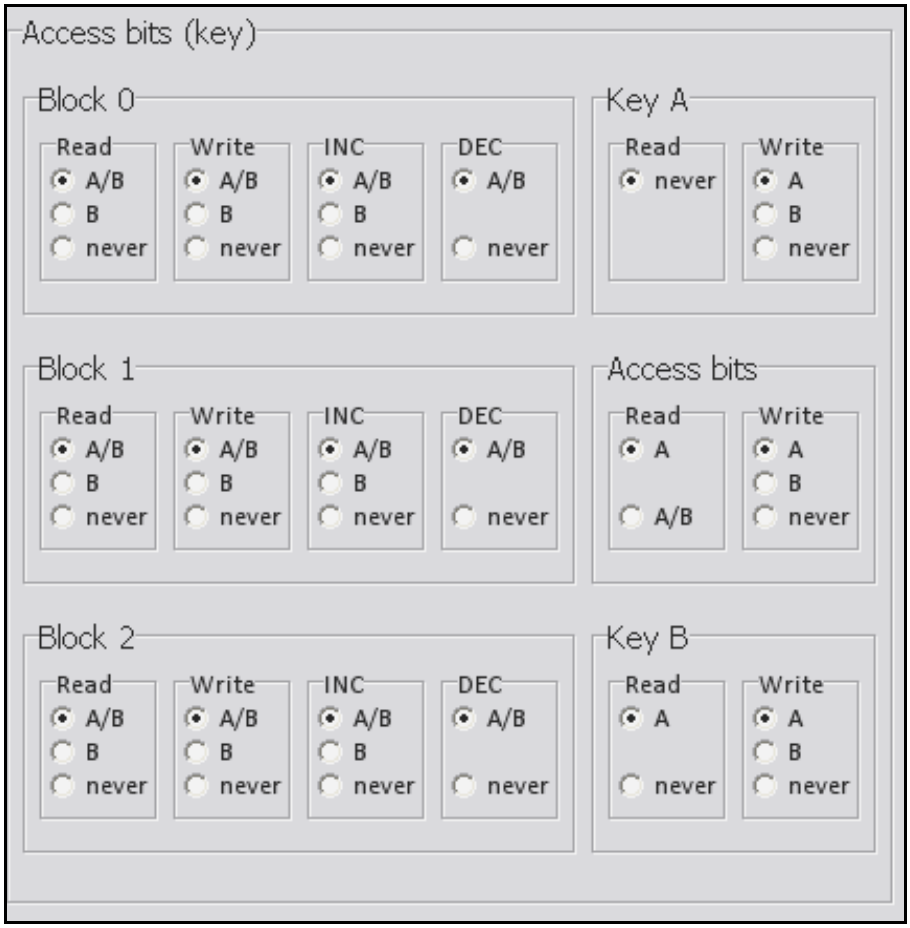
A/B: Verify Key A or Key B

A: Only verify Key A

B: Only verify Key B

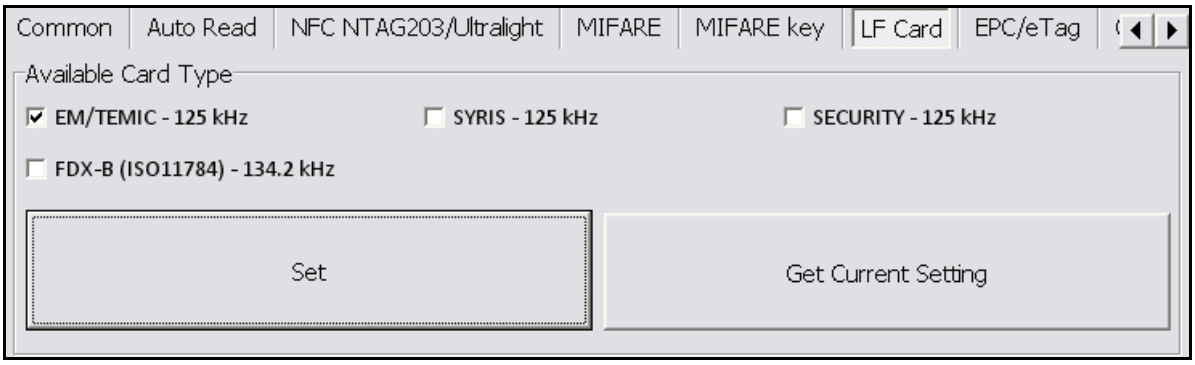
never: will not verify any Key

Please refer to MIFARE specification for more detail.

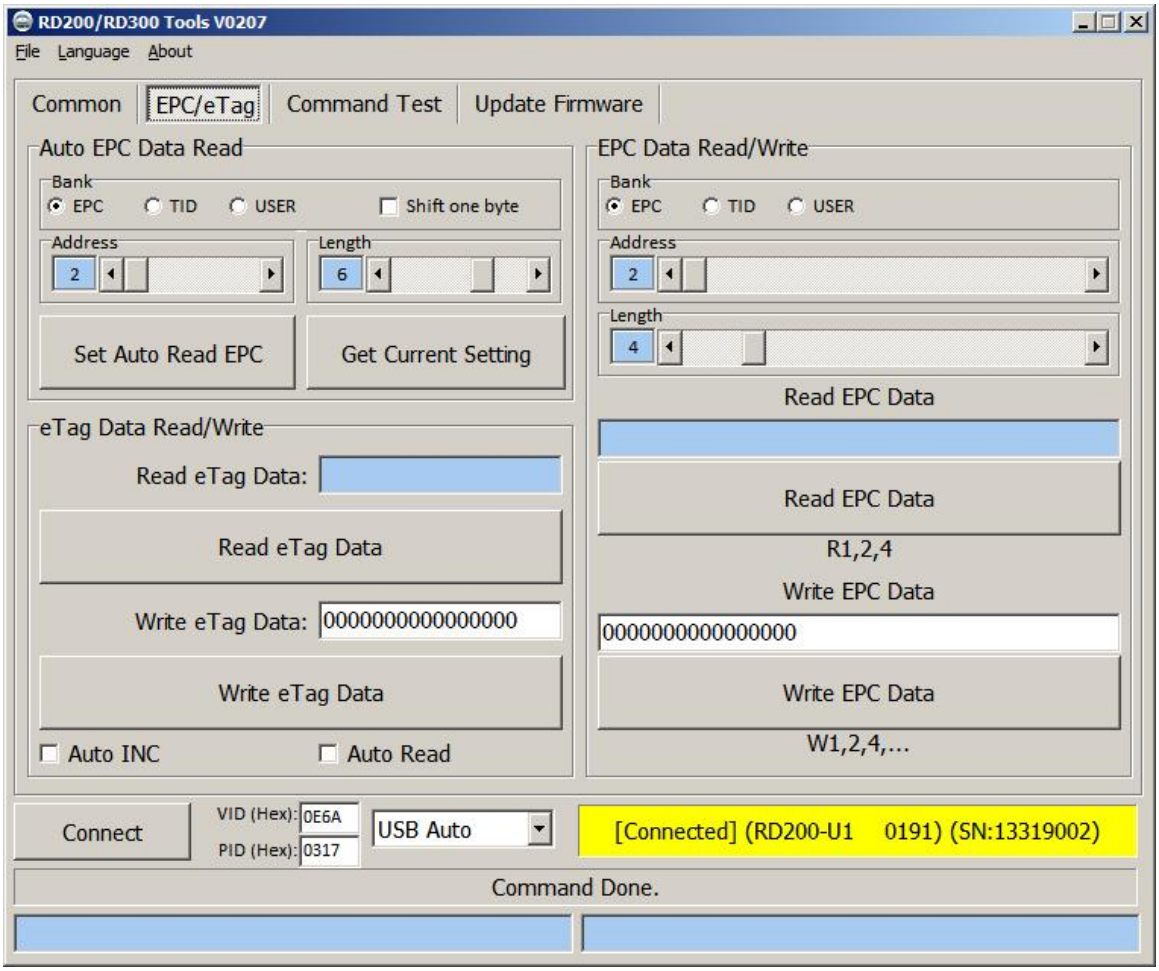


LF Card (RD200-LF and RD300-L series 125KHz supported)

This function can let user to set all available 125kHz card types, after ticked the items then click Set to finish the setting procedure, or click Get Current Setting to read current setting from the reader.



EPC/eTag (RD200-U1 UHF reader supported)



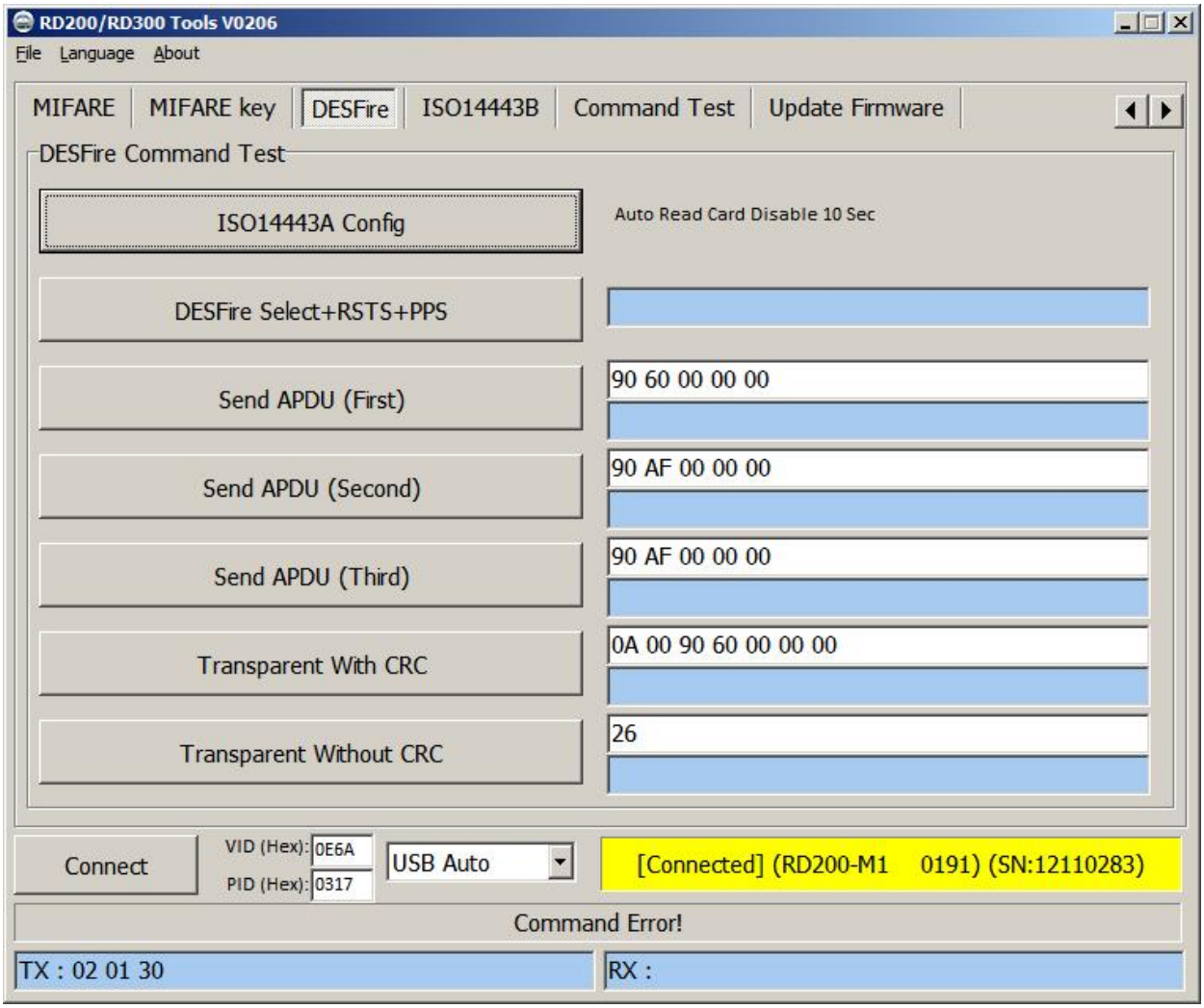
1. Auto EPC Data Read : Select correct bank(EPC, TID or USER), address and length to setup RD200-U1 auto read data.
   Shift one byte: auto read data will shift a byte.
   ex. Unselect shift one byte : 012DF30008DD97B5230F02BD
   Select shift one byte : 00012DF30008DD97B5230F02

2. eTag Data Read/Write: Read/Write test function for Taiwan freeway eTag.

3. EPC Data Read/Write: Test read/write EPC tag data in this area.

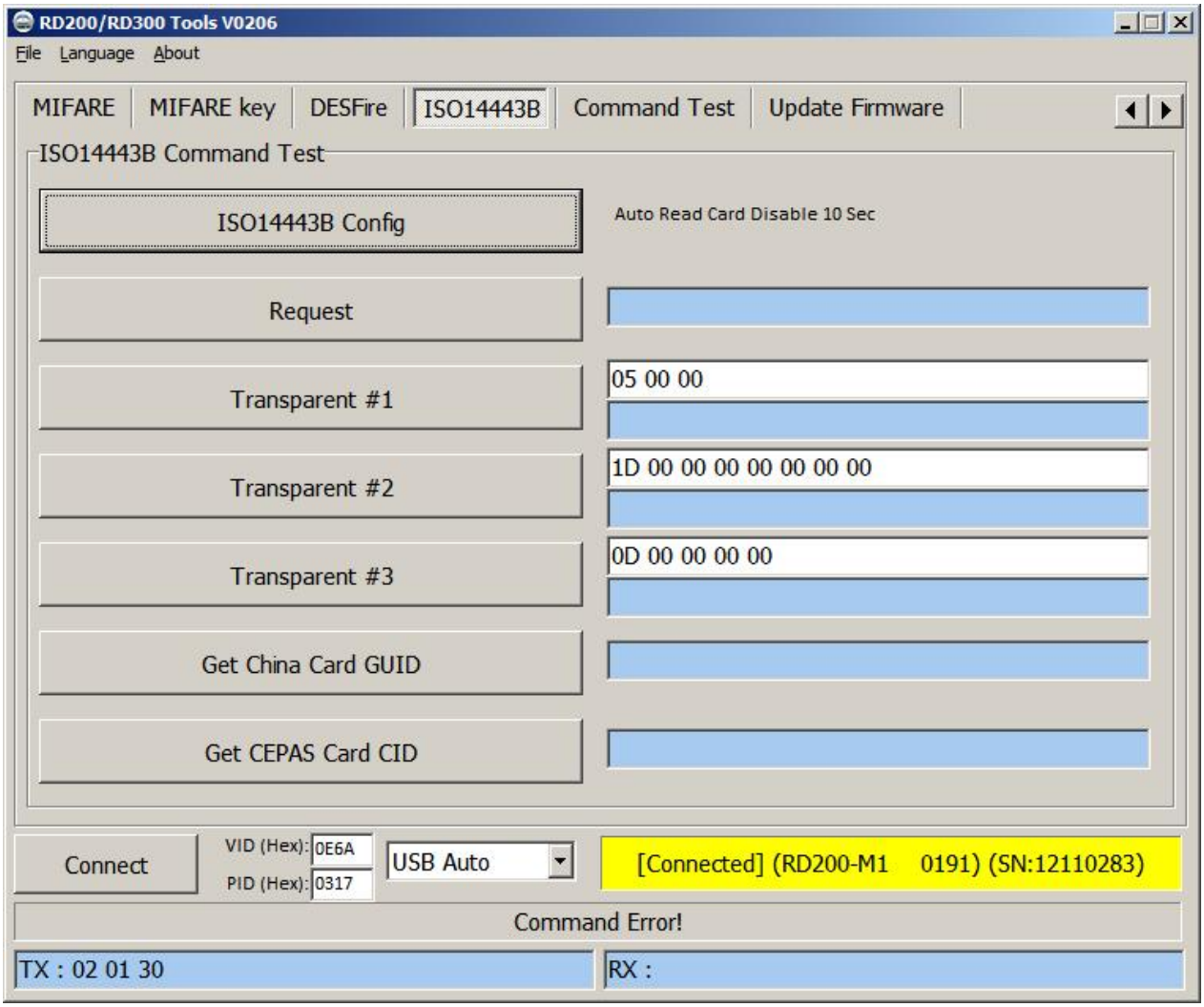
ISO14443A (RD200-M1, RD300-H series supported)

Provide to test ISO14443A command.



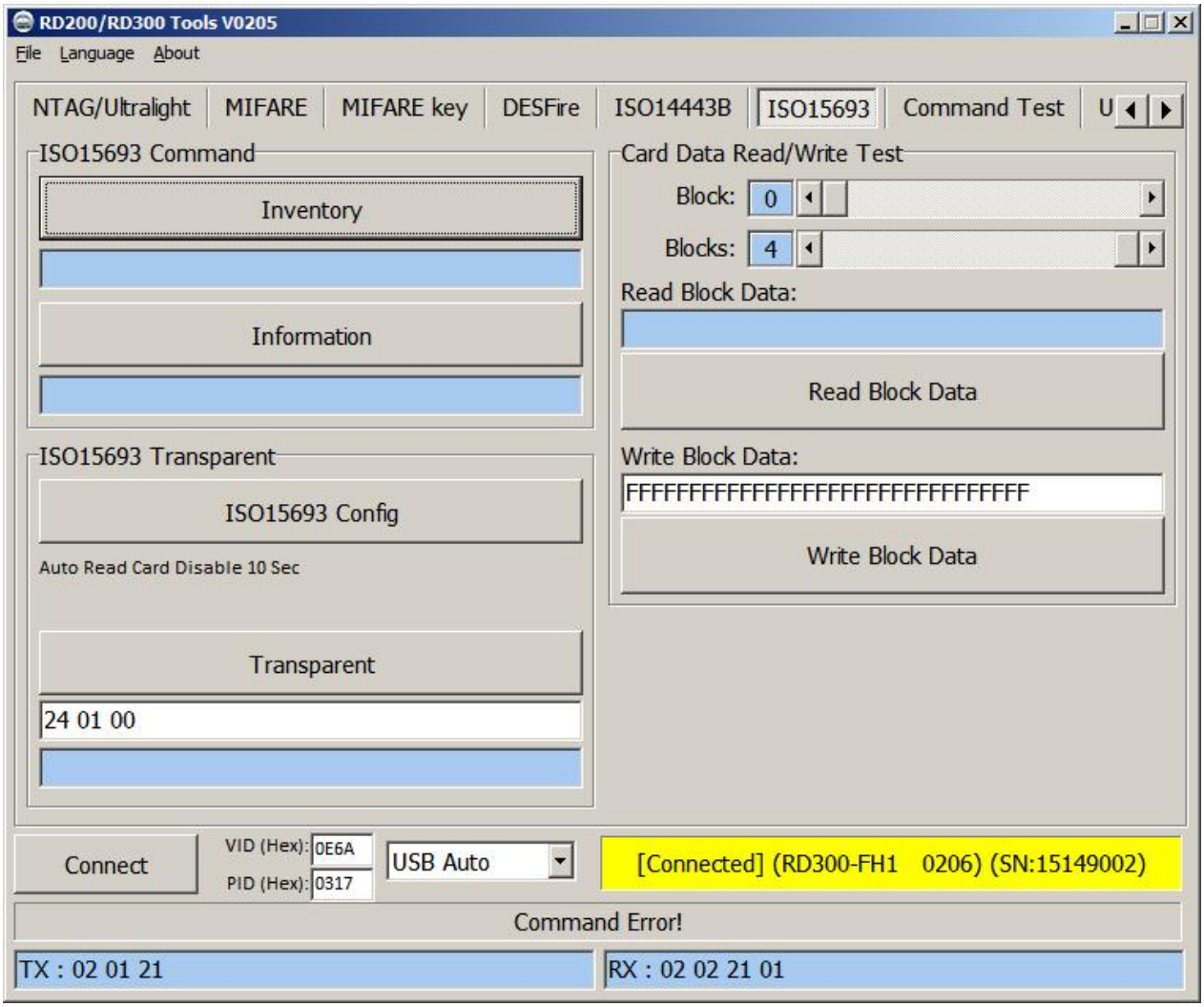
ISO 14443B (RD200-M1, RD300-H series supported)

Provide to test ISO 14443B command.

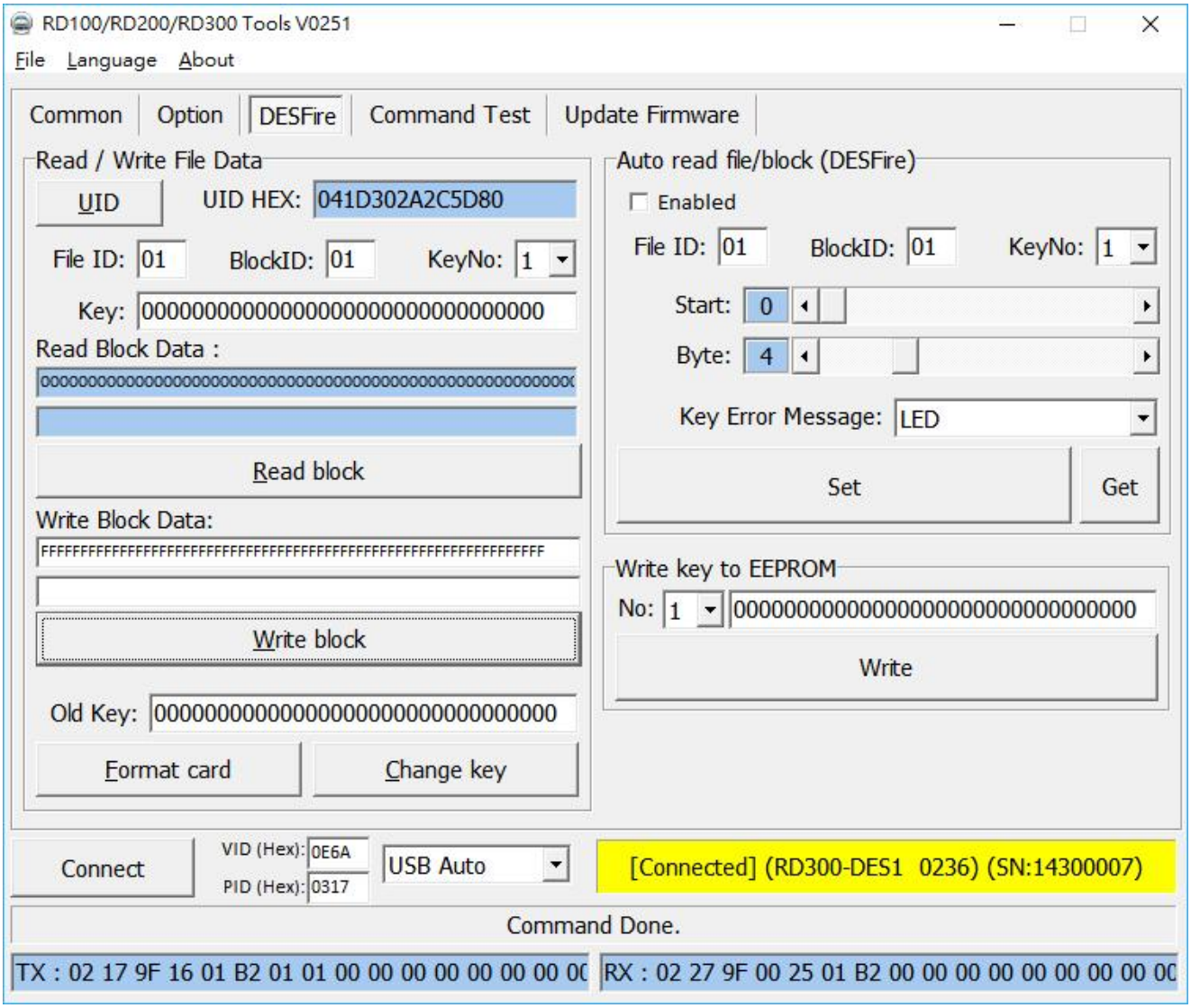


ISO 15693 (RD300-H series supported)

Provide to test ISO 15693 command.



DESFire (RD300-DES1 supported)

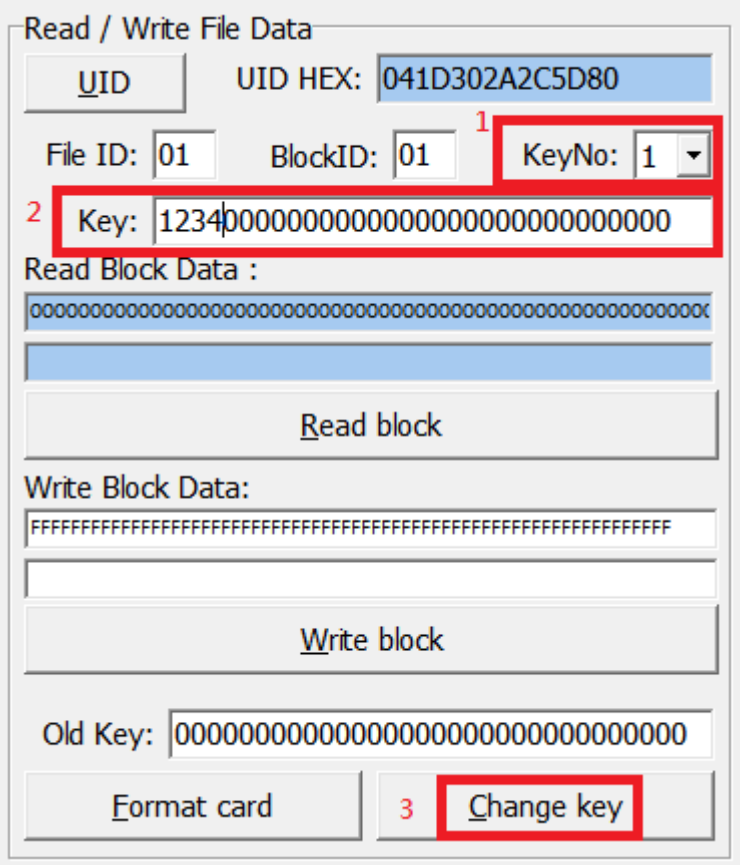


1. UID : Click to read Desfire card's UID.
2. File ID : RD300-DES1 support 4 files (01~04)
3. Block ID : Each File ID have 4 block ID (01~04), Every block have 32 bytes data.

4. Key No (1~8)

0	Format key	Can’t change
1	File Key	FileID 1 read key
2	File Key	FileID 1 write key
3	File Key	FileID 2 read key
4	File Key	FileID 2 write key
5	File Key	FileID 3 read key
6	File Key	FileID 3 write key
7	File Key	FileID 4 read key
8	File Key	FileID 4 write key

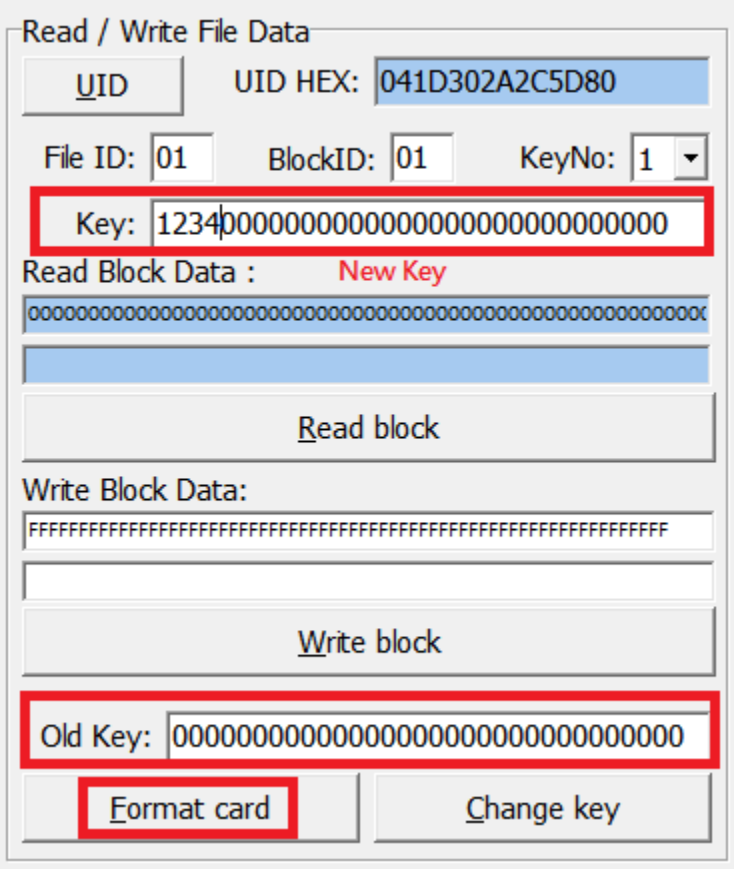
(*Default key is all “0” or all “F”.)



Select KeyNo and input correct key then click “Change key” to change Desfire card’s file key.

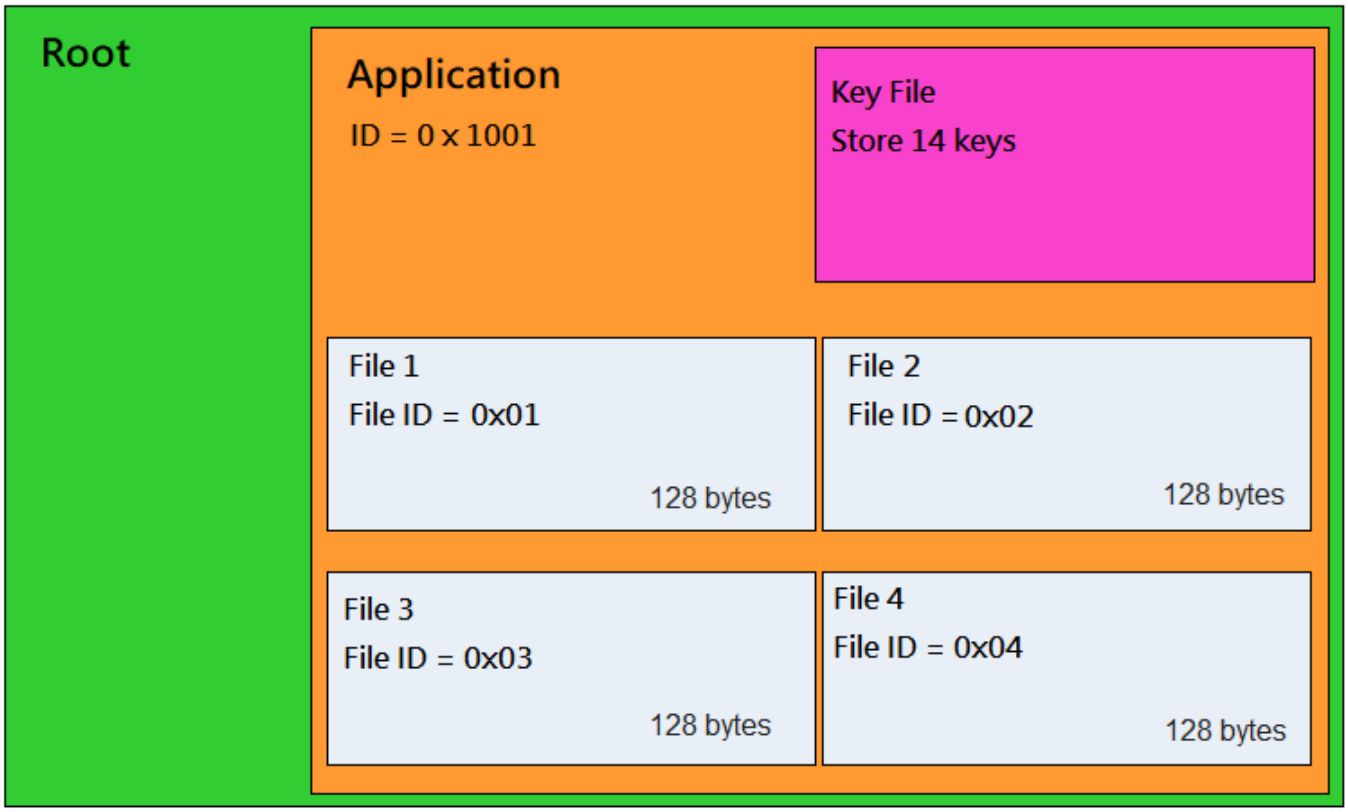
5. Read block : Click read block to read current configured block data.
6. Write block : Click write block to write current configured block data.

7. Format card: Input correct old key and new key to format card to clear all data and change format key.
   When the format card is successful, all file keys will be initialized to all "0"



8. Auto read :
   a. Enable this function and configure FileID, BlockID and KeyNo (EEPROM KEY)
   b. Enable "Auto" in common tab.
   c. Open notepad and punch Desfire card to read.
9. Write key to EEPROM : Input and save key to RD300-DES1 (1~8)

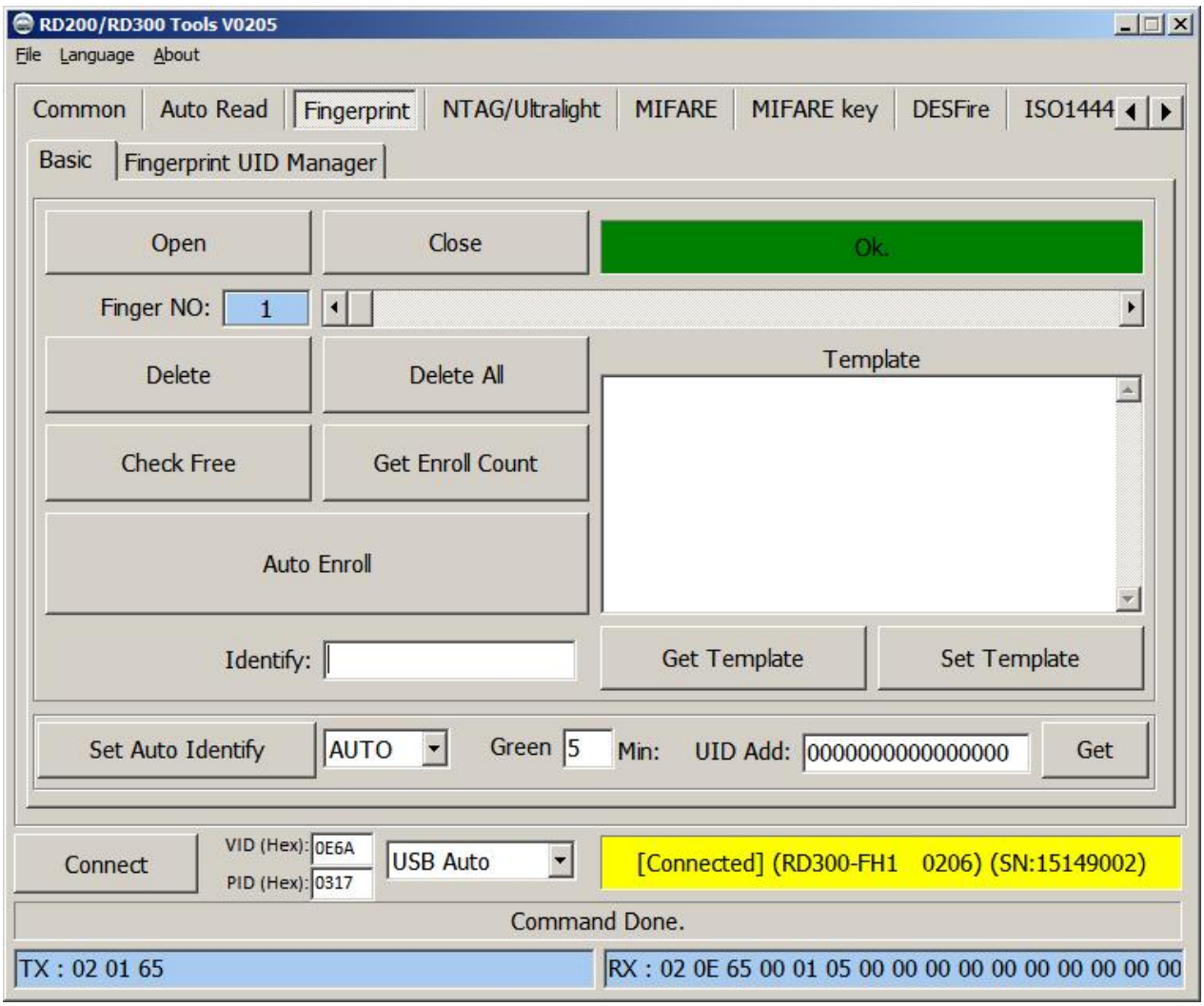
10. Desfire EV1 file structure



Desfire Key structure	
0x00	Application key
0x01	File ID 1 read key
0x02	File ID 1 read/write key
0x03	File ID 2 read key
0x04	File ID 2 read/write key
0x05	File ID 3 read key
0x06	File ID 3 read/write key
0x07	File ID 4 read key
0x08	File ID 4 read/write key
0x09	Reserved
0x10	Reserved
0x11	Reserved
0x12	Reserved
0x13	Reserved

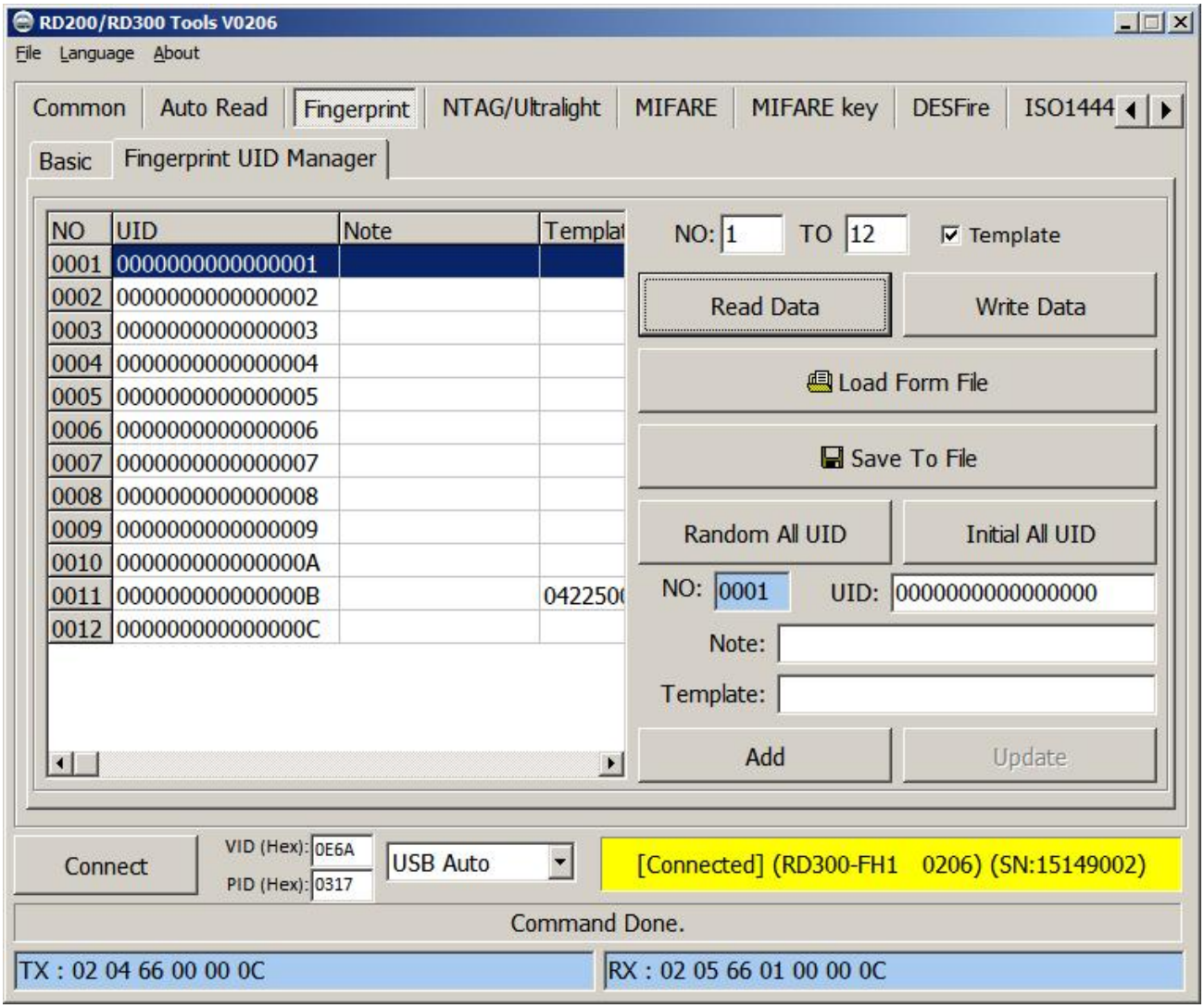
Fingerprint (RD300-FH1 only)

A. Basic



1. **Open / Close** : Setup fingerprint sensor enable/ disable.
2. **Finger No**: RD300-FH1 support 2000 fingerprints. Select from 0 to 1999 to configure fingerprint.
3. **Delete**: Delete selected fingerprint number (Finger No).
4. **Delete all**: Delete all fingerprints.
5. **Check Free**: Check selected fingerprint number is in use or free.
6. **Get Enroll Count**: Check how many fingerprint numbers was used.
7. **Auto Enroll**: Select fingerprint number and click auto Enroll to save fingerprint to reader.
8. **Template**: Fingerprint's template. Every fingerprint have unique template.
9. **Identify**: Identification of the capture fingerprint with database number.
10. **Set Auto Identify**: Default is auto, set to off will disable fingerprint recognition.
11. **Green**: Setup fingerprint sensor auto sleep timing. Default is 5 minutes.
12. **UID Add**: Change prefix to fingerprint numbers.

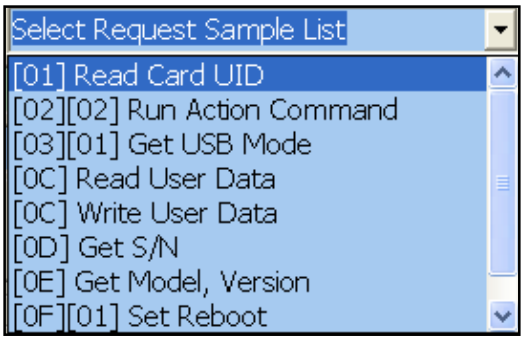
B. Fingerprint UID Manager



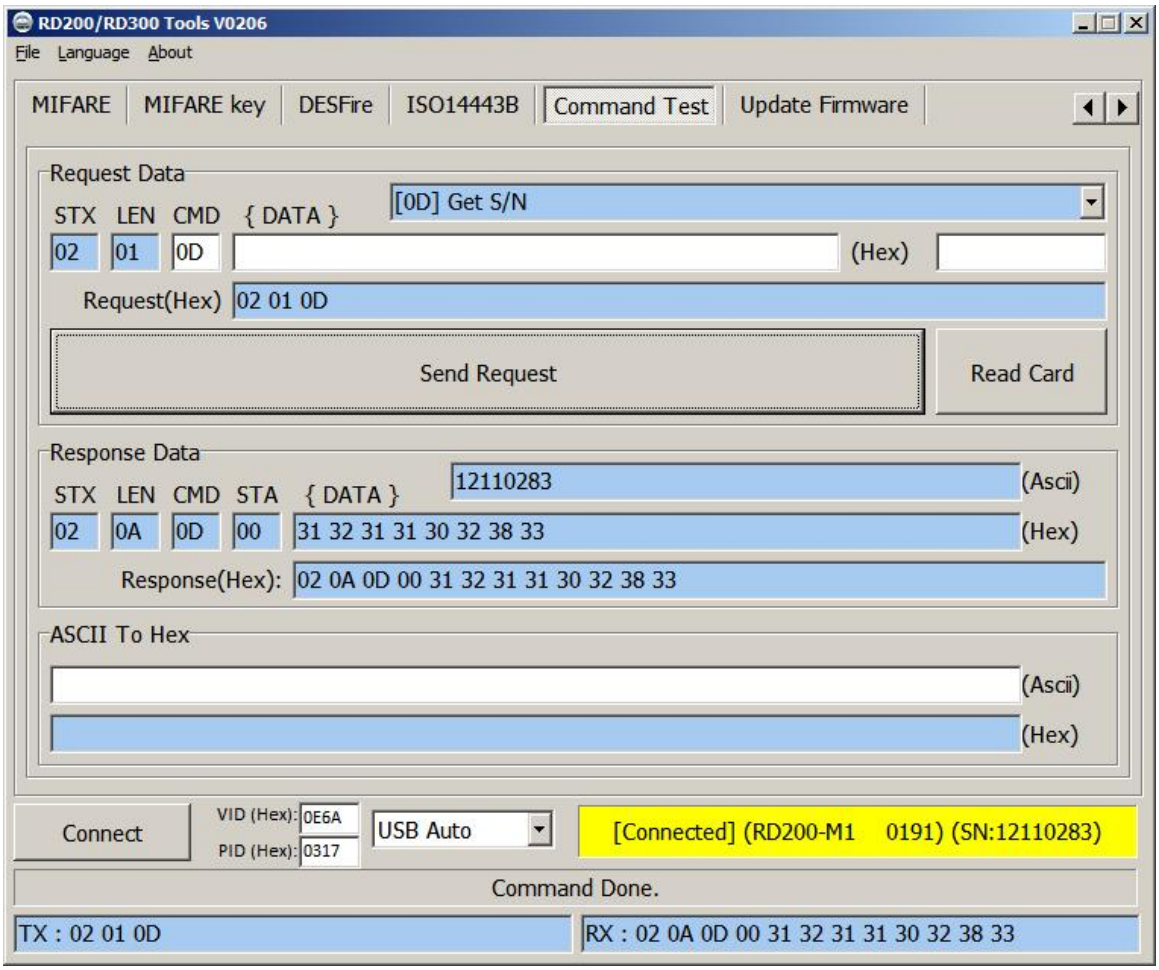
1. **Read Data**: Select number range to read fingerprint database in reader.
2. **Write Data**: Select number range to write fingerprint database in reader.
3. **Load Form File**: Load “uid.txt” file.
4. **Save to File**: Save current data to txt file.(uid.txt)
5. **Random All UID**: Set fingerprint’s UID to random value.
6. **Initial All UID**: Set fingerprint’s UID to default value.
7. **Add / Update**: Add / modify specific fingerprint’s UID, note and template.
   (Only add / modify to screen, please don’t forget save to file.)

Command Test

This page provides several command examples, user can choose the example from the Request Sample List, or directly input the CMD and {DATA} to test the command.



1. Click Send Request to send command to reader,
   Click Read Card to read card data.
2. The response data of the request command are all display on Response Data fields.
3. The bottom of screen function is a utility to convert ASCII characters to Hexadecimal.



Firmware Update

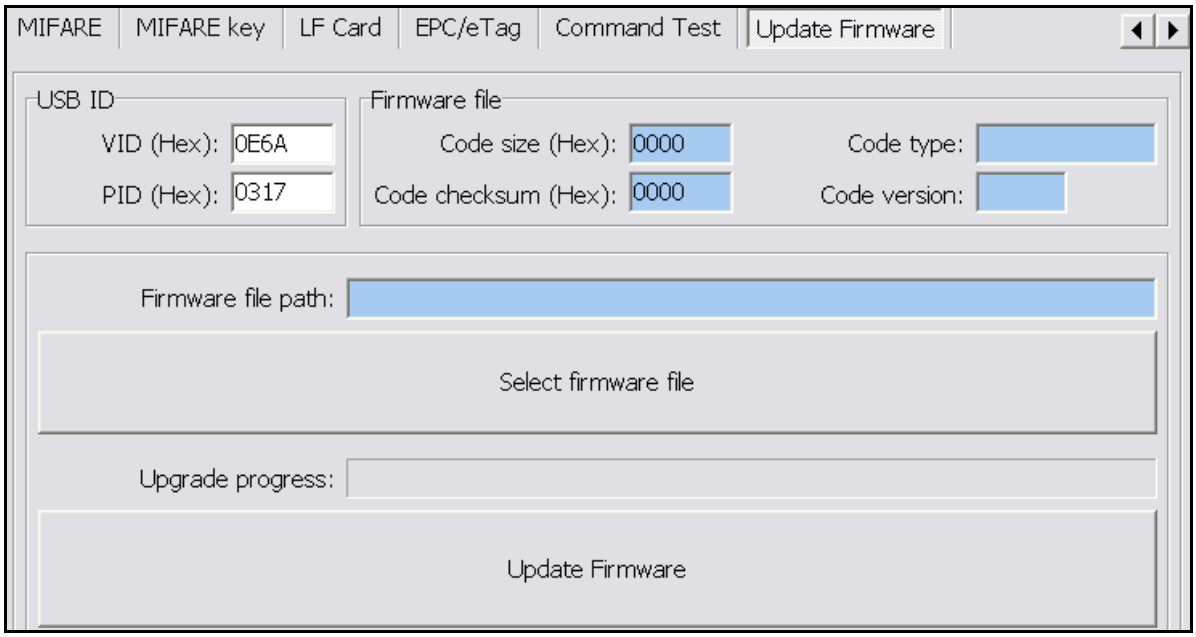
Before update the firmware, system will pop up a warning message window.

The firmware update steps as below:

Step 1. Click Select firmware file

Step 2. Choose a firmware file (*.SYB)

Step 3. Click Update Firmware to finish the firmware update



FCC INFORMATION

The Federal Communication Commission Radio Frequency Interference Statement includes the following paragraph:

The equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communication. However, there is no grantee that interference will not occur in a particular installation. If this equipment dose cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on , the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.