

# **RD200/300 Tool OPERATION MANUAL**



**V02.50**

Model description .....	2
Installation .....	4
Driver installation (For change to virtual COM port mode) .....	5
Common Setting.....	8
Auto Read (RD200-M1, RD300-H series supported) .....	13
NTAG/Ultralight (RD200-M1, RD300-H series supported) .....	14
MIFARE .....	17
MIFARE Key.....	18
LF Card (RD200-LF and RD300-L series 125KHz supported) .....	20
EPC/eTag (RD200-U1 UHF reader supported) .....	21
ISO14443A (RD200-M1, RD300-H series supported).....	23
ISO 14443B (RD200-M1, RD300-H series supported).....	24
ISO 15693 (RD300-H series supported) .....	25
DESFire (RD300-DES1 supported).....	26
Fingerprint (RD300-FH1 only) .....	31
Command Test .....	33
Firmware Update.....	34

## 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



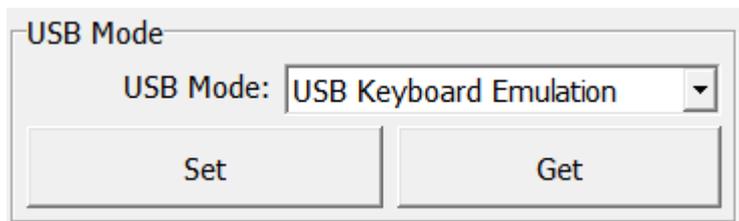
DESFire Reader

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.



The image shows a software window titled "USB Mode". Inside the window, there is a label "USB Mode:" followed by a dropdown menu. The dropdown menu is currently set to "USB Keyboard Emulation". Below the dropdown menu, there are two buttons: "Set" on the left and "Get" on the right.

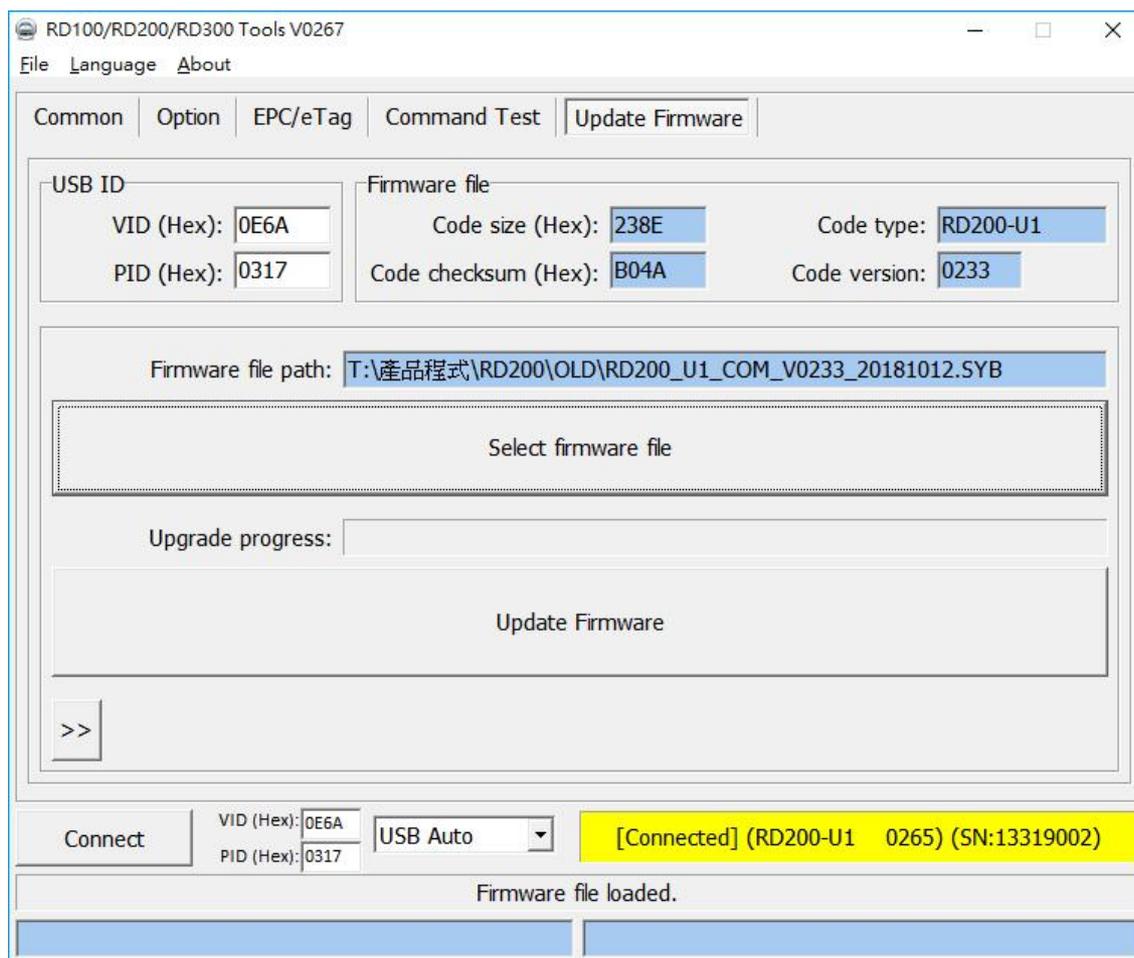
## Driver installation (For change to virtual COM port mode)

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.

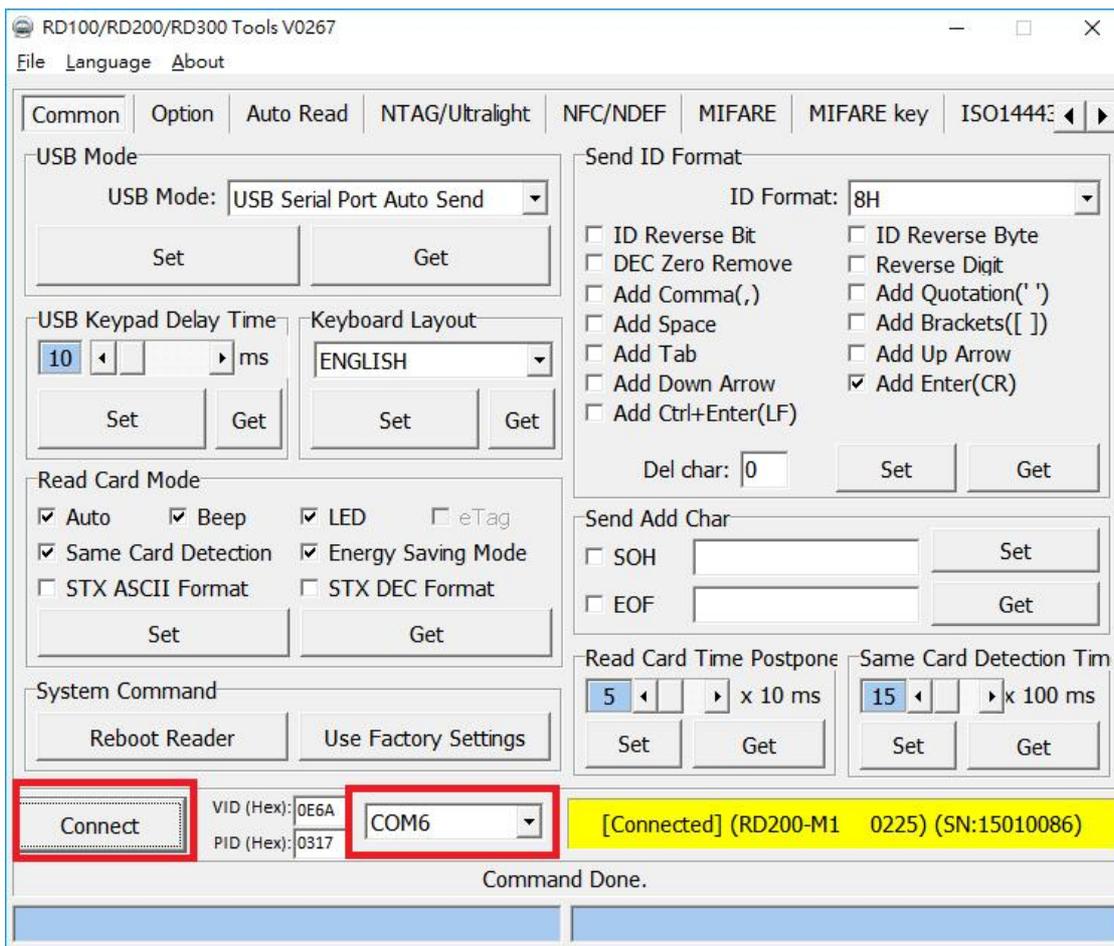


4. Allocate the driver folder, and then complete the installation.

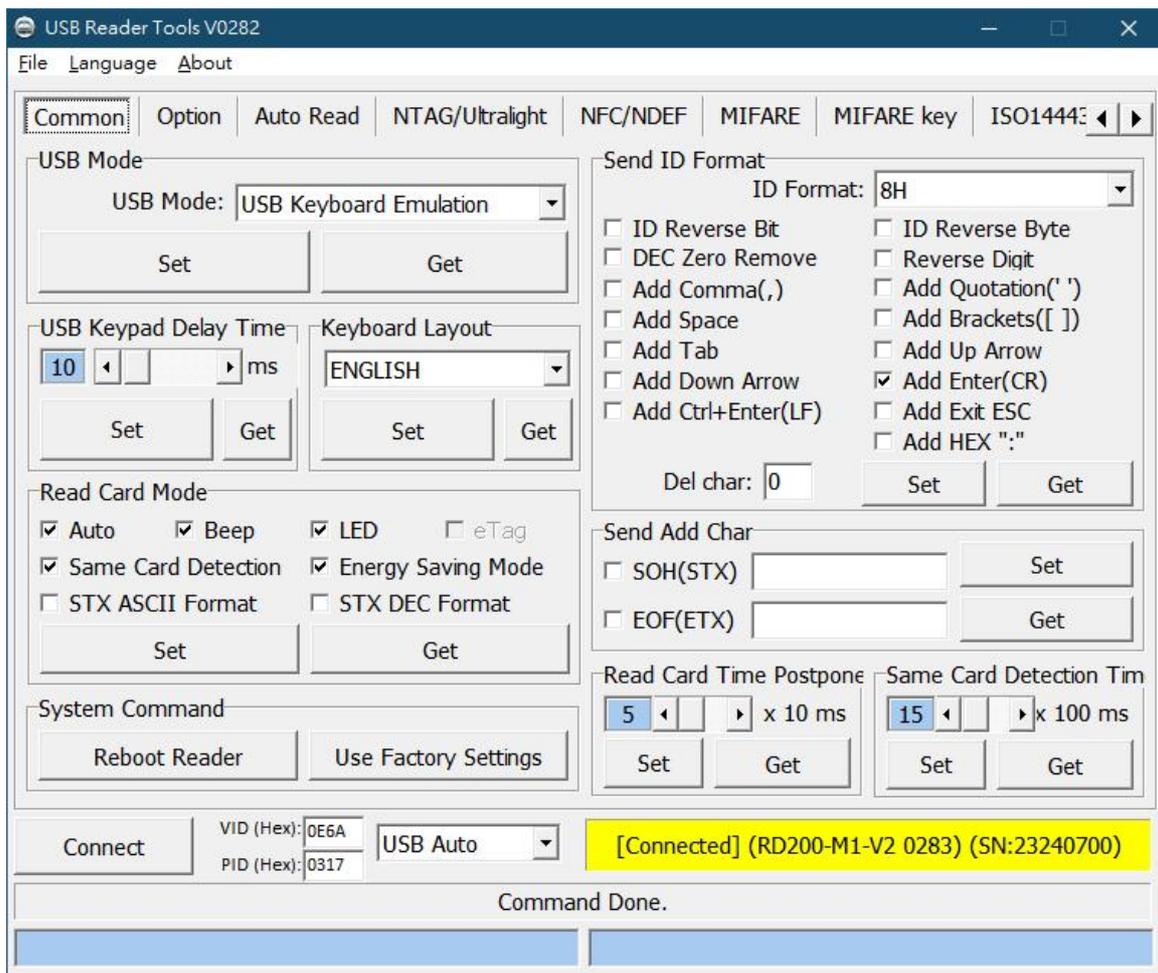
(SYRIS\_RFID\_DVD\RD200\Driver)



5. Connect reader with COM port mode.

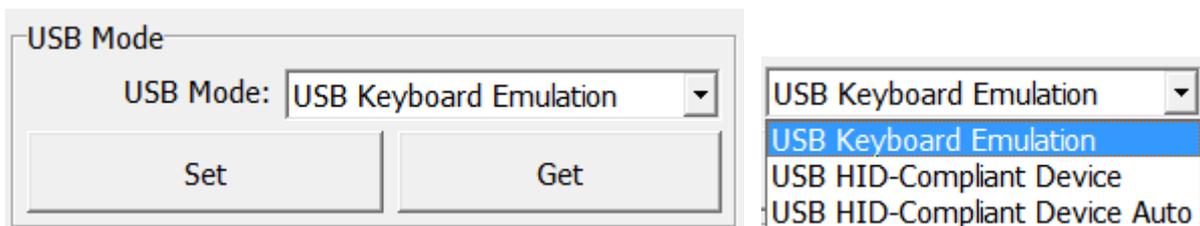


# Common Setting



## 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 :**

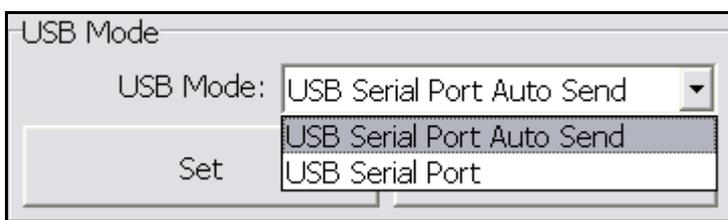
Device response data when received protocol command, and the data will be queued in device buffer.

### **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.



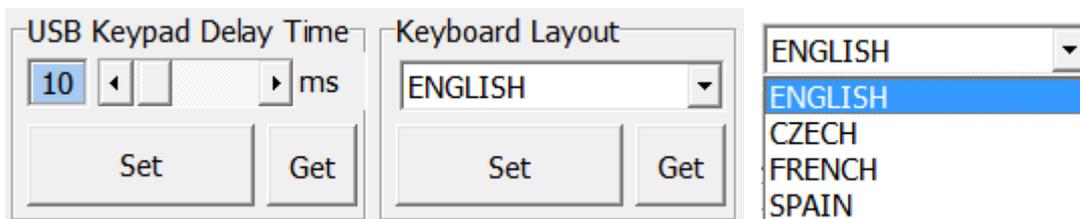
### **USB Serial Port Auto Send :**

The device sends 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 and Keyboard layout**

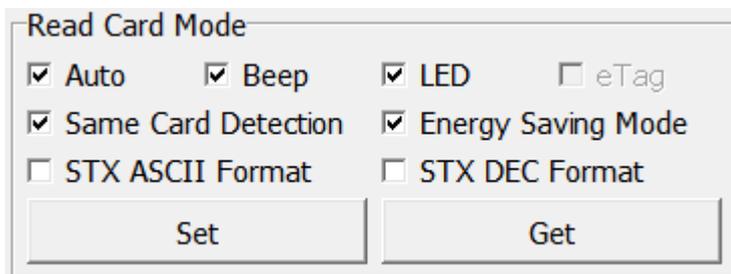


USB Keypad Delay Time: Set keypad delay timing to reduce the keyboard code sending speed when read tag.

Keyboard layout: Support multiple languages keyboard layout.

## 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.



Read Card Mode

Auto     Beep     LED     eTag

Same Card Detection     Energy Saving Mode

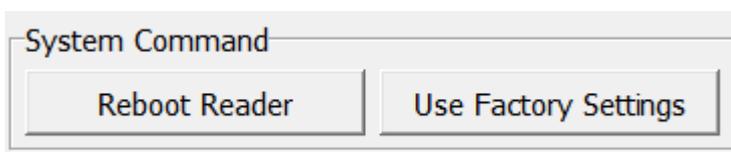
STX ASCII Format     STX DEC Format

**Set**    **Get**

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

## 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.



System Command

**Reboot Reader**    **Use Factory 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.

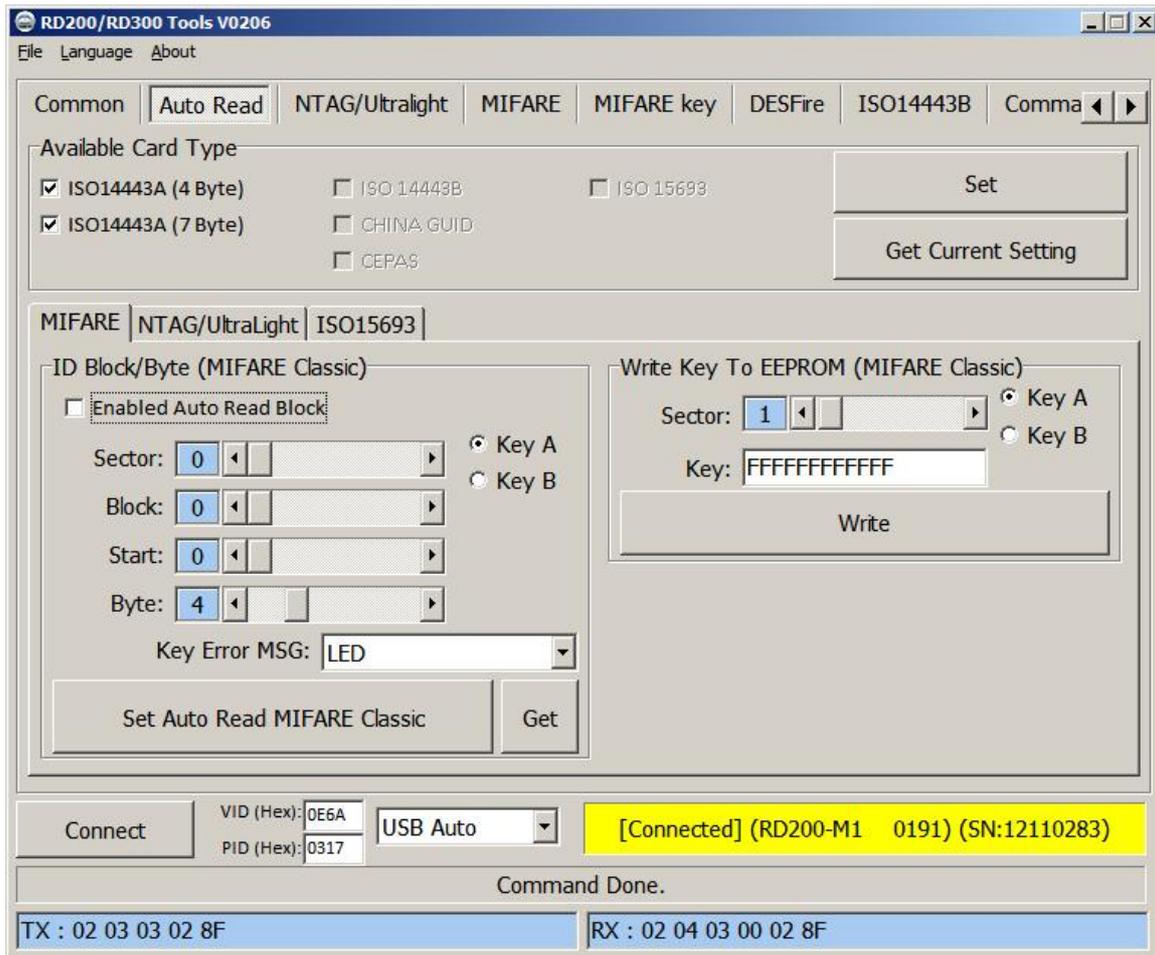
After adjusted the time then click **Set** to finish the setting procedure, or click **Get Current**

**Setting** to read current setting from the reader.

The image shows a software interface with two sections. The first section is titled "Read Card Time Postponement" and features a numeric input field containing the value "5", followed by a left arrow, a right arrow, and the text "x 10 ms". Below this input are two buttons: "Set" and "Get Current Setting". The second section is titled "Same Card Detection Time" and features a numeric input field containing the value "15", followed by a left arrow, a right arrow, and the text "x 100 ms". Below this input are two buttons: "Set" and "Get Current Setting".

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

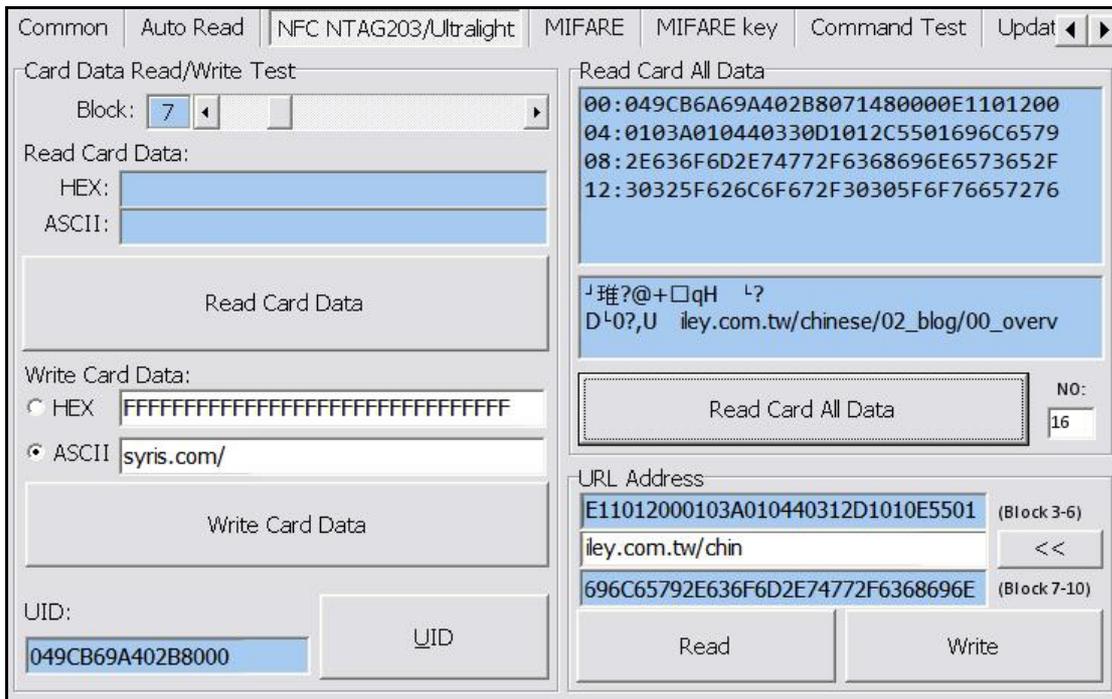
- Available card type: Setup read card type.
- Set auto read Mifare block in this tab to read specific block automatically.
  1. Enable and select correct block.
  2. Click set auto read.
  3. Reader will always read selected block automatically.



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

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

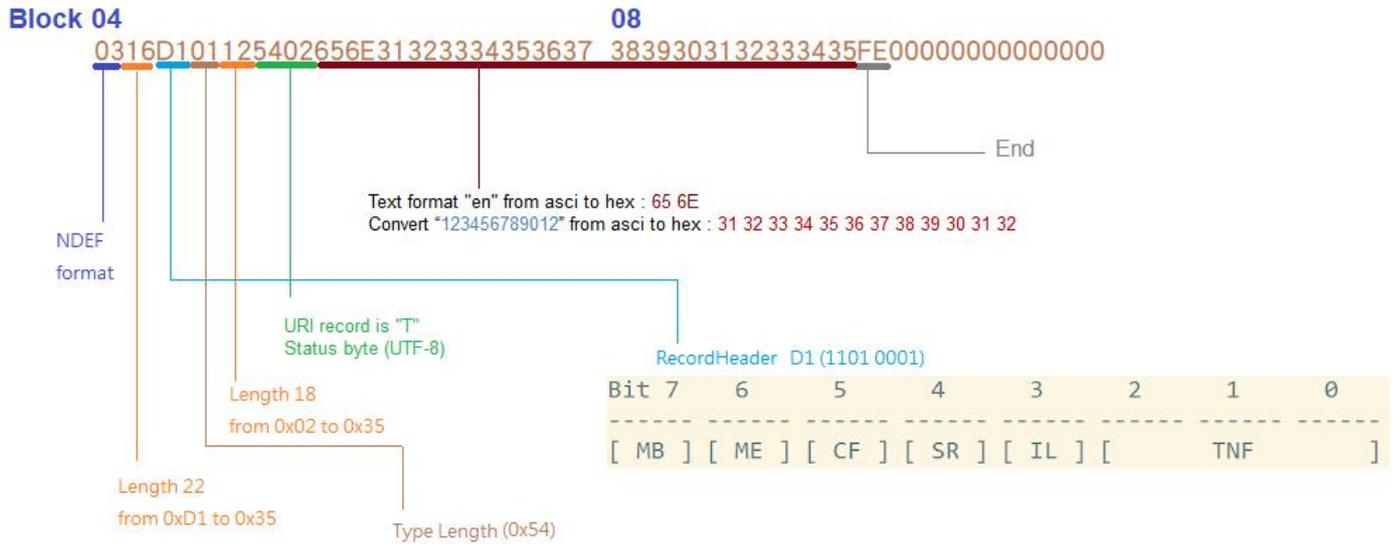
1. Read Card Data: Select correct block to read NFC tag's data.
2. Write Card Data: Select correct block to write NFC tag's data.  
(Recommend select HEX code to write.)
3. UID : Read tag's UID
4. Read Card All Data: Input max block number in "NO" and start to read all data.
5. URL address: This is a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



For example.

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

Convert “123456789012” from ascii 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](http://www.google.com)" to NTAG with NDEF format.

Convert "google.com" from ascii 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.

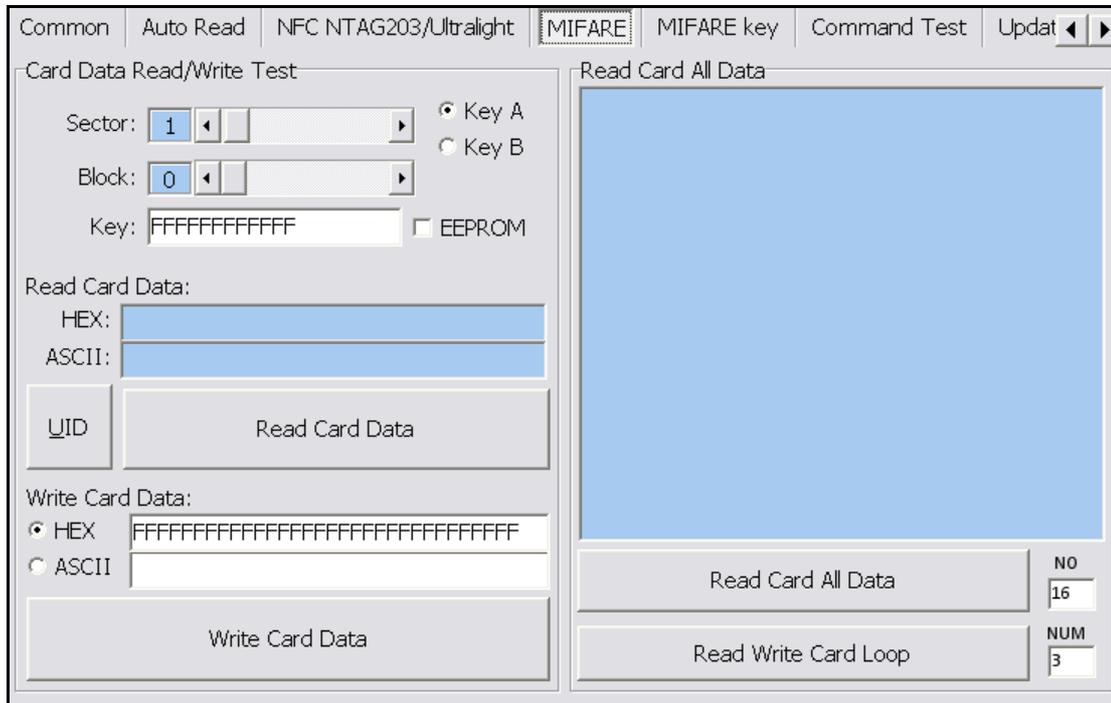
Block 04~07 : 030FD1010B550167 6F6F676C652E636F

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

The screenshot shows the 'MIFARE key' tab in a software application. The 'Write Key To Card' section is active, displaying a 'Sector' dropdown set to '1'. Below it, the 'Old key' is set to 'FFFFFFFF'. The 'New key' section contains three input fields: 'Key A' (FFFFFFFF), 'Access bits' (FF078069), and 'Key B' (FFFFFFFF). A large button labeled 'Issue MIFARE Card' is positioned at the bottom of this section. To the right, the 'Access bits (key)' section shows configurations for Block 0, Block 1, and Block 2, each with Read, Write, INC, and DEC options for Key A and Key B.

## 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 "FFFFFFFF"

**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.

This is a close-up view of the 'Write Key To Card' section from the main screenshot. It shows the 'Sector' dropdown set to '1', the 'Old key' input field containing 'FFFFFFFF', and the 'New key' section with 'Key A' (FFFFFFFF), 'Access bits' (FF078069), and 'Key B' (FFFFFFFF). The 'Issue MIFARE Card' button is highlighted with a dashed border.

## 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.

The screenshot shows a configuration window titled "Access bits (key)". It is divided into three main sections for Block 0, Block 1, and Block 2. Each block section contains four sub-sections: Read, Write, INC, and DEC. Each sub-section has three radio button options: A/B, B, and never. Additionally, there are sections for Key A and Key B, each with Read and Write sub-sections, each having three radio button options: A, B, and never.

Block	Action	Read	Write	INC	DEC
Block 0	Read	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B
	Write	<input type="radio"/> B	<input type="radio"/> B	<input type="radio"/> B	<input type="radio"/> B
	INC	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never
	DEC	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never
Key A	Read	<input checked="" type="radio"/> never	<input checked="" type="radio"/> A		
	Write	<input type="radio"/> B	<input type="radio"/> never		
Block 1	Read	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B
	Write	<input type="radio"/> B	<input type="radio"/> B	<input type="radio"/> B	<input type="radio"/> B
	INC	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never
	DEC	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never
Access bits	Read	<input checked="" type="radio"/> A	<input checked="" type="radio"/> A		
	Write	<input type="radio"/> A/B	<input type="radio"/> never		
Block 2	Read	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B	<input checked="" type="radio"/> A/B
	Write	<input type="radio"/> B	<input type="radio"/> B	<input type="radio"/> B	<input type="radio"/> B
	INC	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never
	DEC	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never	<input type="radio"/> never
Key B	Read	<input checked="" type="radio"/> A	<input checked="" type="radio"/> A		
	Write	<input type="radio"/> never	<input type="radio"/> never		

## 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.

Common | Auto Read | NFC NTAG203/Ultralight | MIFARE | MIFARE key | **LF Card** | EPC/eTag | (◀ ▶)

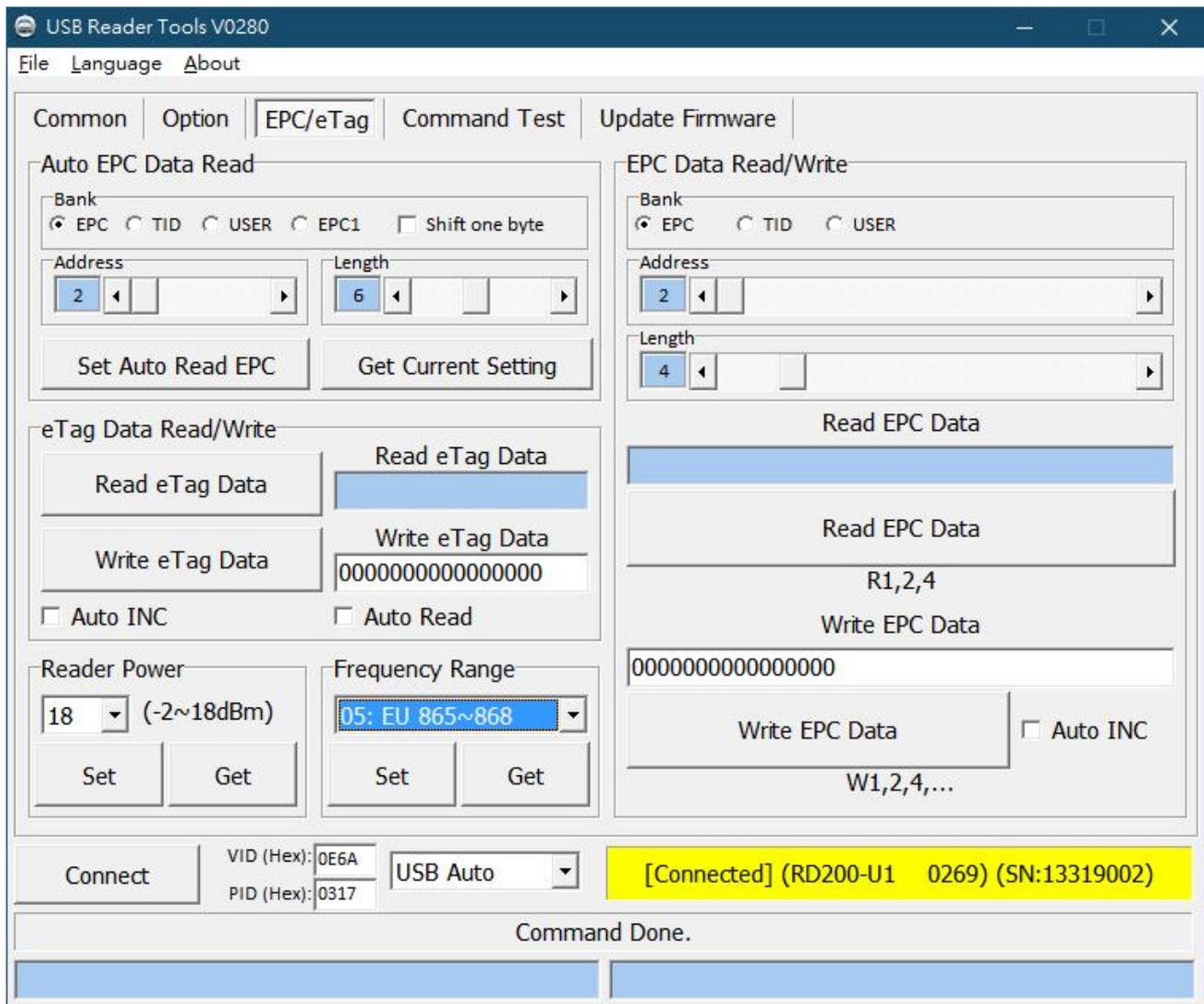
Available Card Type

EM/TEMIC - 125 kHz       SYRIS - 125 kHz       SECURITY - 125 kHz

FDX-B (ISO11784) - 134.2 kHz

**Set**      Get Current Setting

## 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. Reader power: -2~18 dbm. Default is max power 18.

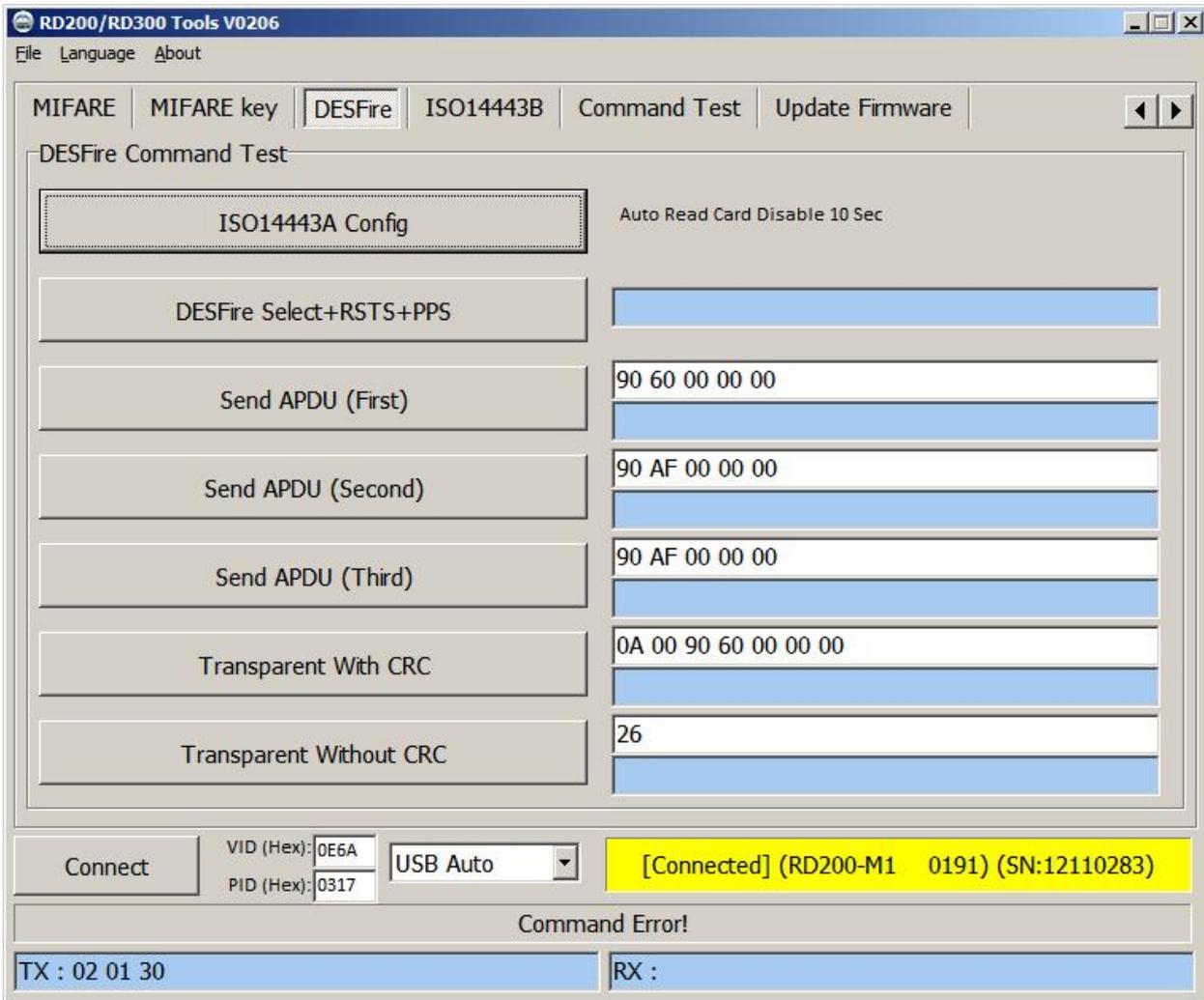
4. Frequency Range:

No.	Location	Frequency Range (MHz)
01	U.S.A	902~928
02	Taiwan	922~928
03	China	920~925
04	China 2	840~845
05	Europe	865~868
06	Japan	916~921
07	Korea	917~921
08	Vietnam	918~923
09	Europe 2	916~920
0A	India	865~867
0B	Brazil	902~907.5 / 915~928

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

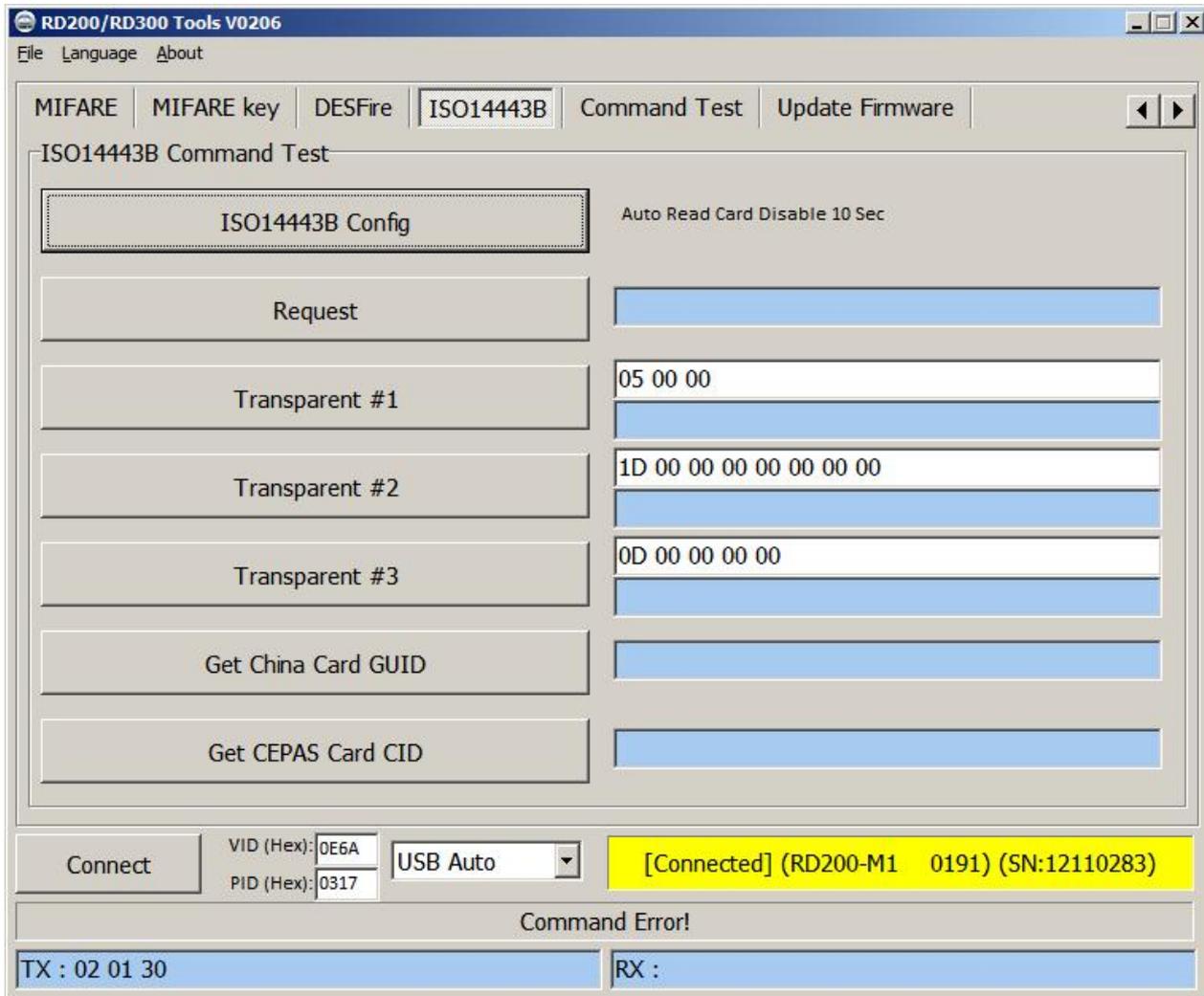
# ISO14443A (RD200-M1, RD300-H series supported)

Provide to test ISO14443A command.



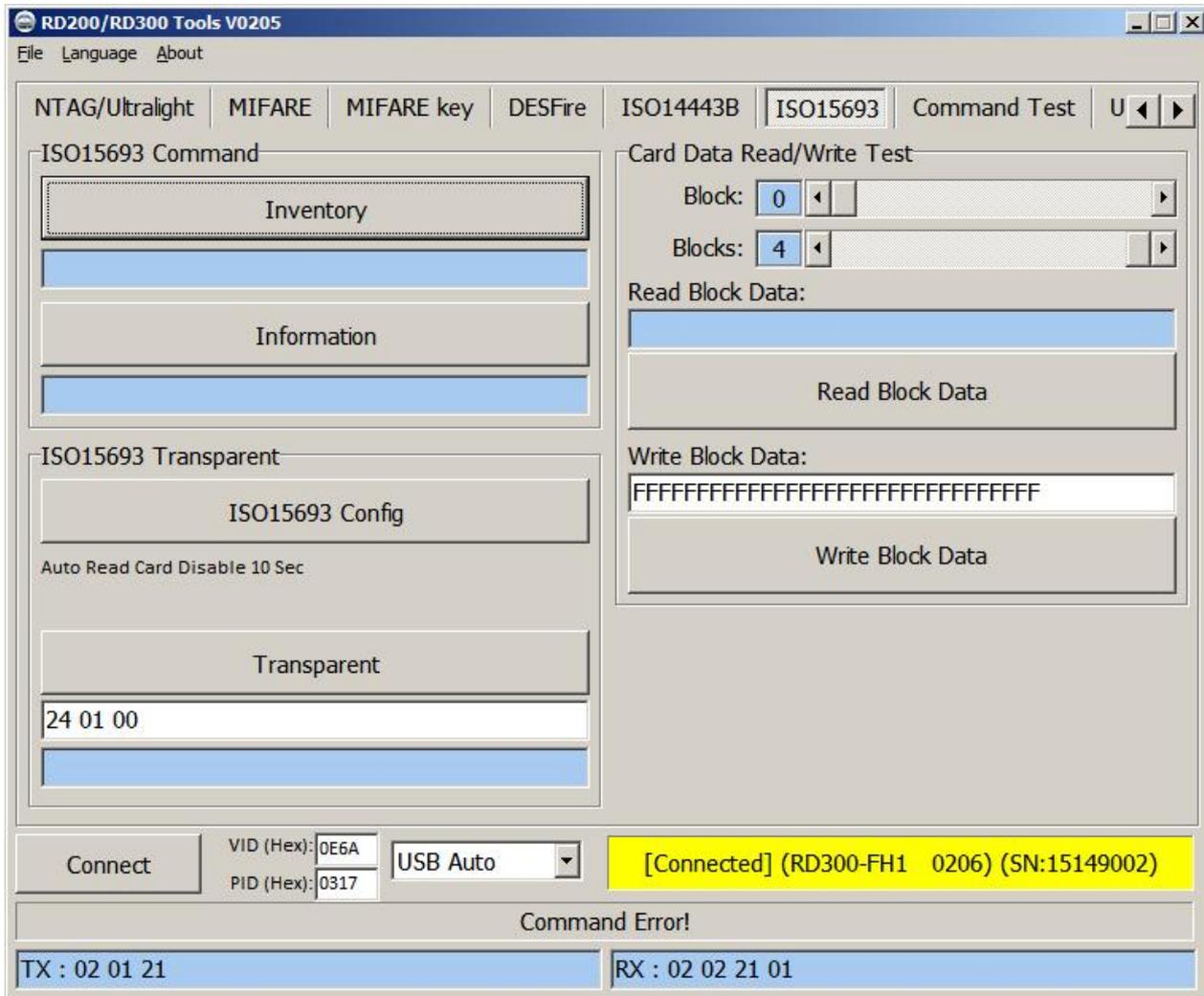
# ISO 14443B (RD200-M1, RD300-H series supported)

Provide to test ISO 14443B command.

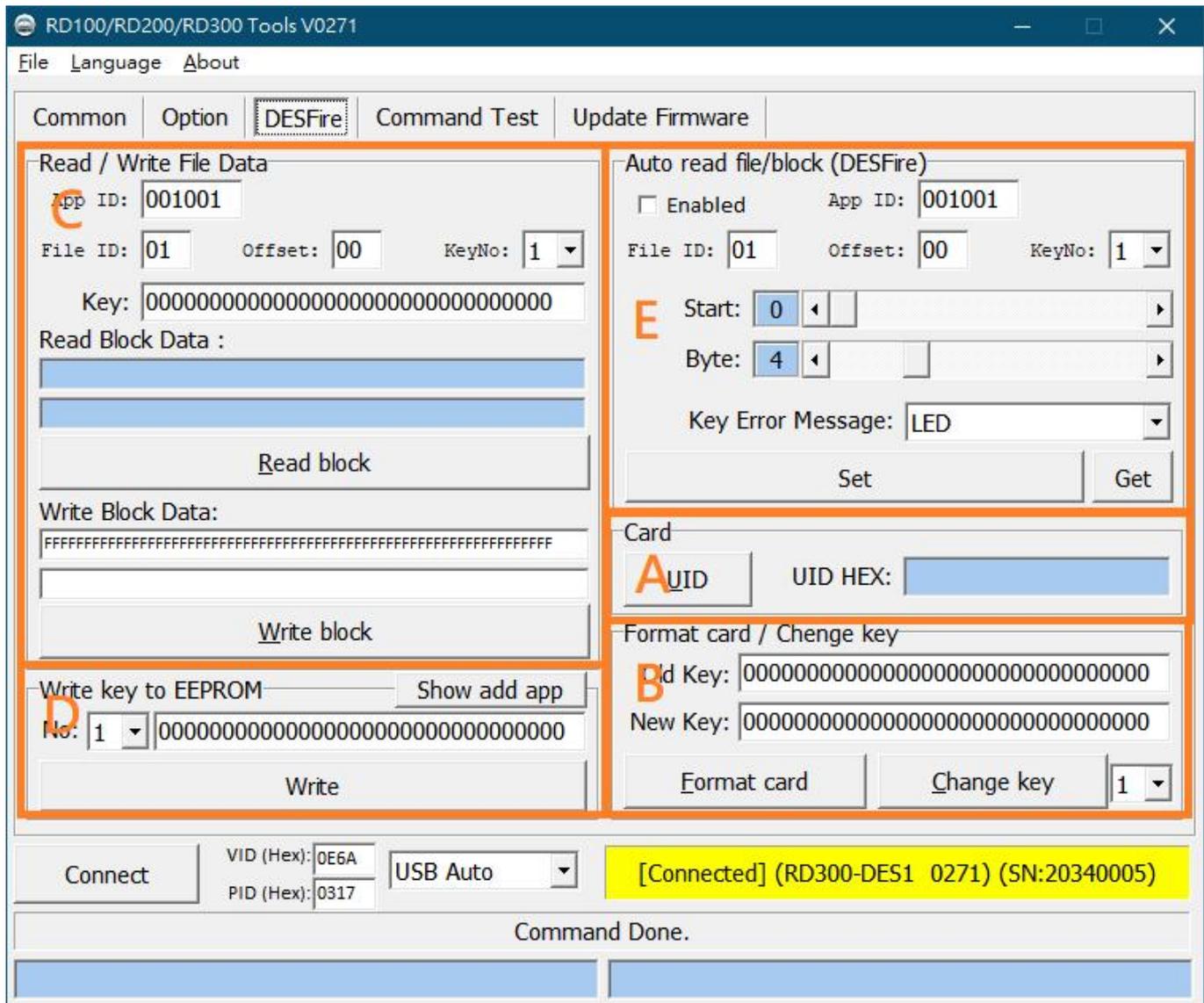


# ISO 15693 (RD300-H series supported)

Provide to test ISO 15693 command.



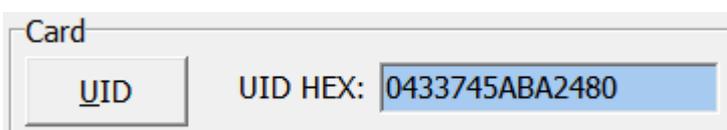
## DESFire (RD300-DES1 supported)



The Desfire tab can be divided into 5 functional areas.

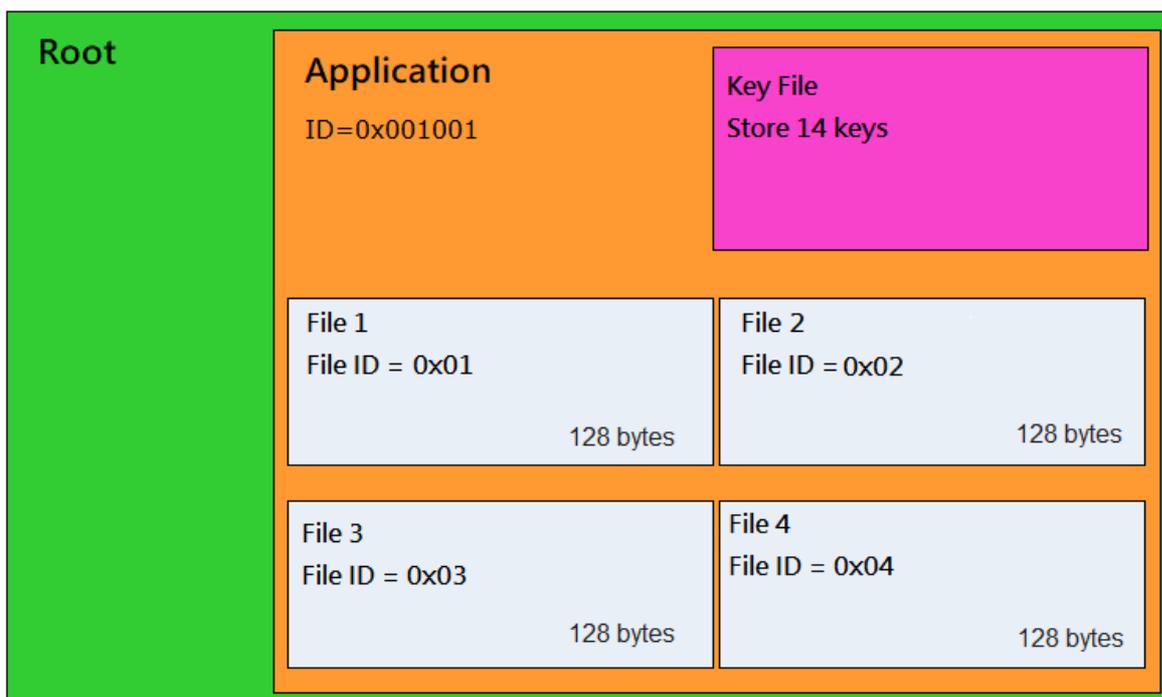
- A. Read the UID of the card**
- B. Format the card or change the file key.**
- C. Read/ write card's file data.**
- D. Save the file key to RD300-DES1 & create customize application.**
- E. Auto read the file data of Desfire card and output as keyboard emulation.**

A. **Read the UID of the card** : Support read Mifare and Desfire card's UID.



**B. Format the card or change the file key. (3DES encryption)**

**Format card** : Input correct Desfire's application key and new key to format card to clear all data and change application key. (\*Default key is "all 0" or "all F".)



When the format card is successful, all file keys will be initialized to "all 0"

**Change Key** : Select Key No. and input correct key then click "Change key" to change Desfire card's file key. (\*Default App ID is "001001", default key is "all 0".)

Key No.	Define	Function
0	Application key	Format card
1	File Key	File ID 1 read key
2	File Key	File ID 1 read/write key
3	File Key	File ID 2 read key
4	File Key	File ID 2 read/write key
5	File Key	File ID 3 read key
6	File Key	File ID 3 read/write key
7	File Key	File ID 4 read key
8	File Key	File ID 4 read/write key

### C. Read/ write card's file data.

Read / Write File Data

App ID: 001001      KeyNo: DES/3DES

File ID: 01      Offset: 00      KeyNo: 1

Key: 00000000000000000000000000000000

Read Block Data :

Read block

Write Block Data:

Write block

App ID : Default App ID is "001001".

Key No: Default format is 3DES encryption, Select 3DES or AES key to decrypt Desfire card.

File ID : Input correct file ID to read/write data.RD300-DES1 default file ID are 01~04.

Offset : Each File ID have 128 bytes data with standard format.

Set up offset to read different parts of data.

RD300-DES1 can read/write 32 bytes of data with one command.

Key No: Select correct key to unlock file data

ex. Read data from "file ID 02" need select key 3 or key 4.

Write data to "file ID 01" need select key 2.

Key: file key.

Read block : Click read block to read current configured block data.(32 bytes)

Write block : Click write block to write current configured block data.(32 bytes)



E. Auto read the file data of Desfire card and output as keyboard emulation.

The dialog box is titled "Auto read file/block (DESFire)". It contains the following fields and controls:

- A dropdown menu set to "Disable".
- An "App ID" field with the value "001001".
- A "File ID" field with the value "01".
- An "Offset" field with the value "00".
- A "KeyNo" dropdown menu set to "1".
- A "Start" spinner box set to "0".
- A "Byte" spinner box set to "4".
- A "Key Error Message" dropdown menu set to "LED".
- "Set" and "Get" buttons at the bottom.

- a. Select correct encryption of Desfire card and configure App ID, File ID and offset to read correct data.
- b. Select correct key No.(EEPROM KEY)
- c. Enable "Auto" in common tab.

The dialog box is titled "Read Card Mode". It contains the following checkboxes and controls:

- Auto
- Beep
- LED
- eTag
- Same Card Detection
- Energy Saving Mode
- STX ASCII Format
- STX DEC Format
- "Set" and "Get" buttons at the bottom.

- d. Setup keyboard emulation output format.

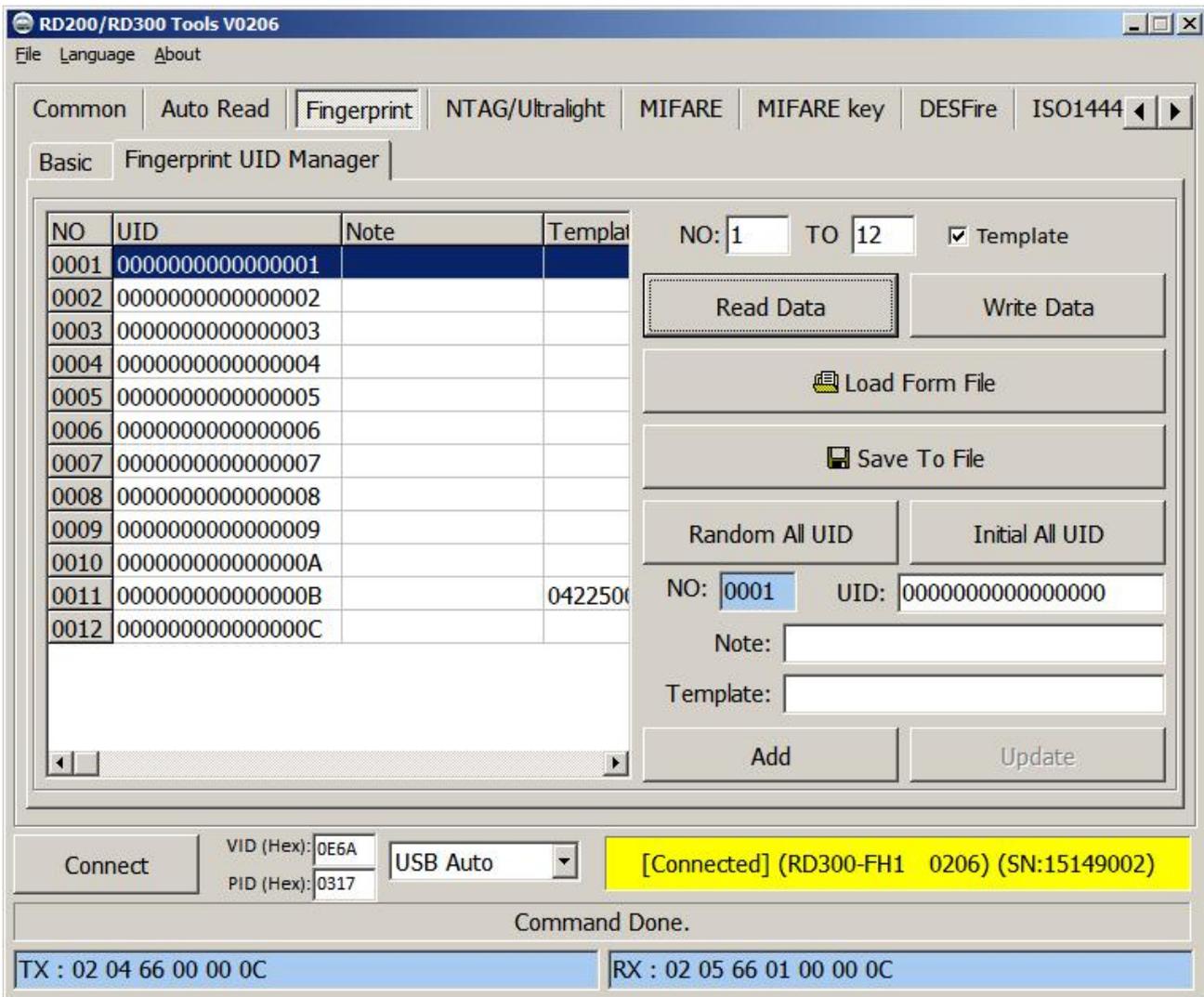
The dialog box is titled "Send ID Format". It contains the following fields and checkboxes:

- An "ID Format" dropdown menu set to "32H".
- ID Reverse Bit
- ID Reverse Byte
- DEC Zero Remove
- Reverse Digit
- Add Comma(,)
- Add Quotation(' ')
- Add Space
- Add Brackets([ ])
- Add Tab
- Add Up Arrow
- Add Down Arrow
- Add Enter(CR)
- Add Ctrl+Enter(LF)
- Add Exit ESC
- A "Del char" field with the value "0".
- "Set" and "Get" buttons at the bottom.

- e. Open notepad and punch Desfire card to read data.



## B. Fingerprint UID Manager



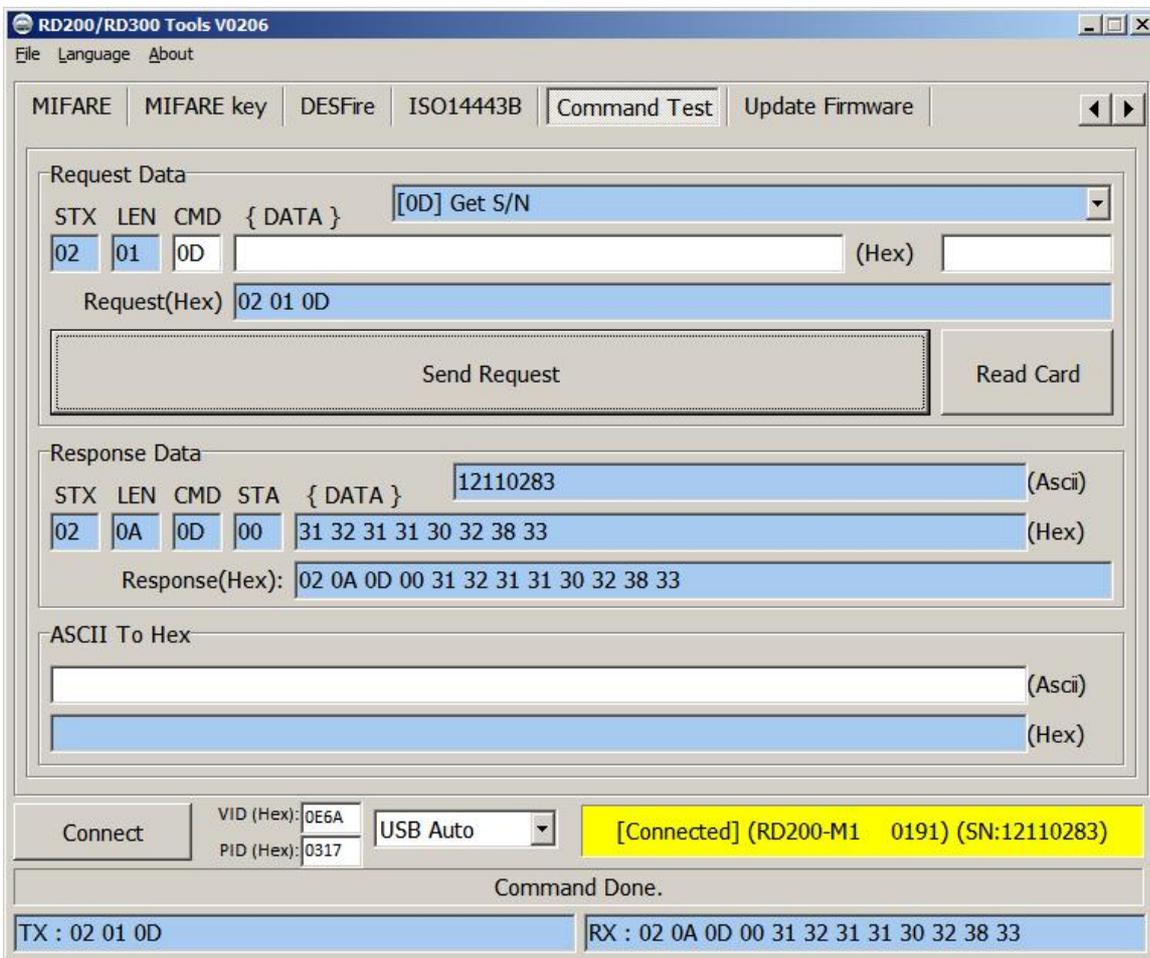
1. **Read Data:** Select number range to read fingerprint database in reader.
2. **Write Data:** Select number range to write fingerprint database in reader.
3. **Load Form File:** Load "uid.txt" file.
4. **Save to File:** Save current data to txt file.(uid.txt)
5. **Random All UID:** Set fingerprint's 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.

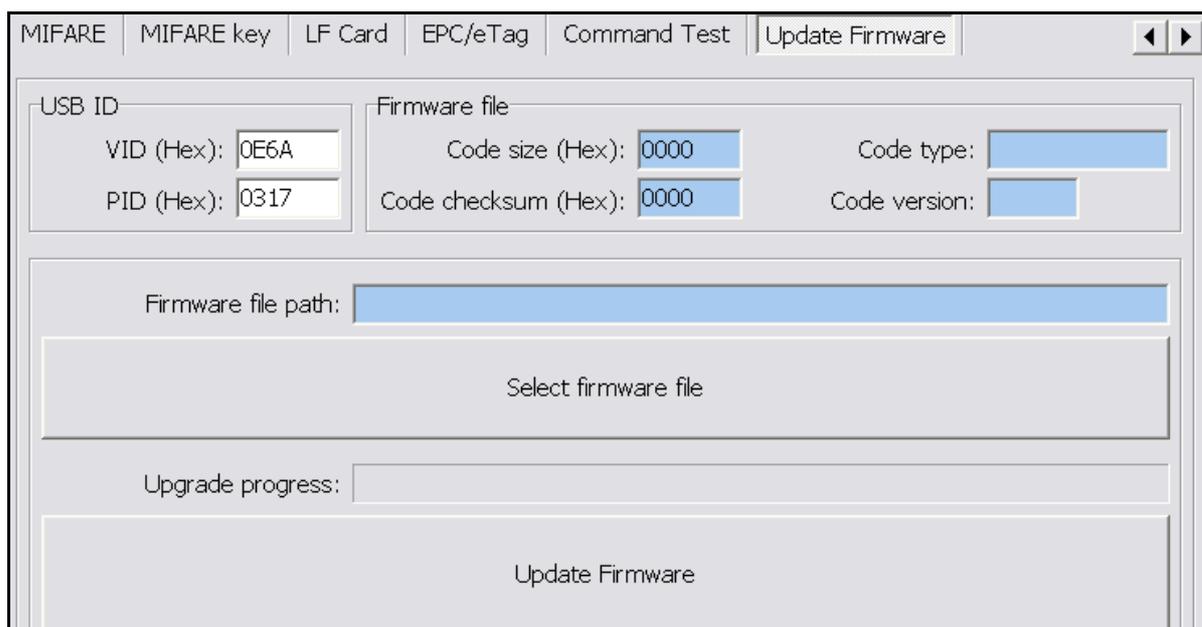


The firmware update steps as below:

**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.