




RD200/300 Tool OPERATION MANUAL




V02.21

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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		<p>DESFire Reader</p> <p>Frequency: 13.56 MHz</p> <p>Support tag: DESFire full function with tools</p>
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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)

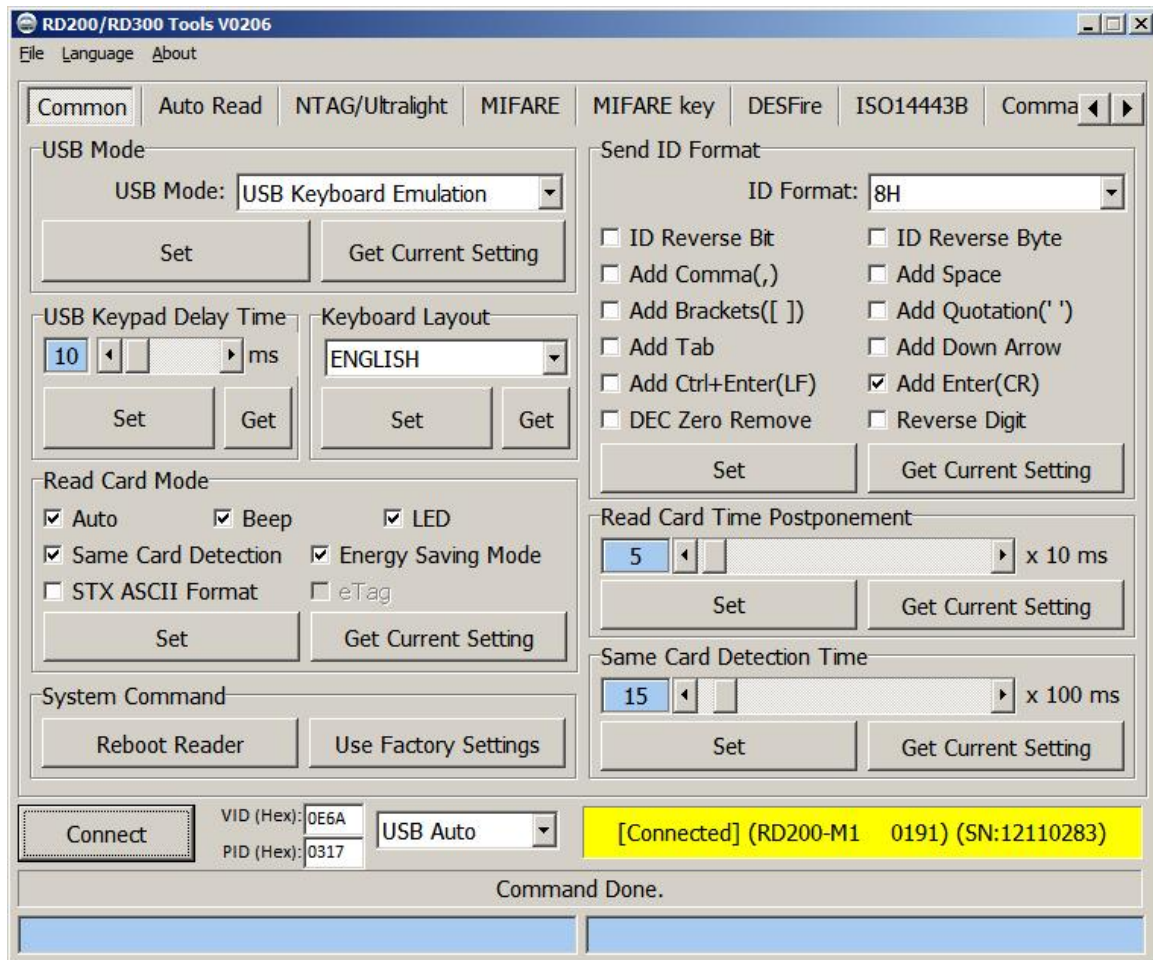
1. Follow firmware update procedure to change virtual COM port mode firmware.
(ex. RD200_U1_COM_V0191_20150316.SYB)
2. Connect RD200/RD300, system will automatically pop-up the "Found New Hardware Wizard" window for install the driver.



3. Allocate the driver folder, and then complete the installation.
(SYRIS_RFID_DVD\RD200\Driver)

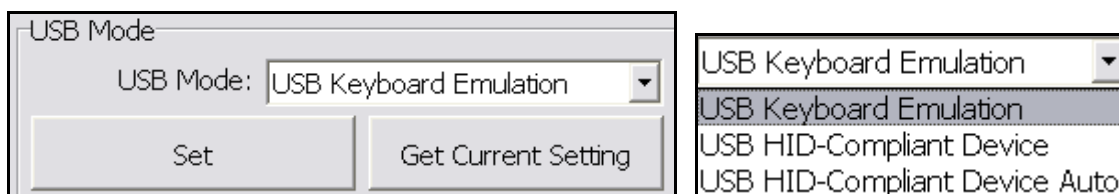


Common Setting



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 :**

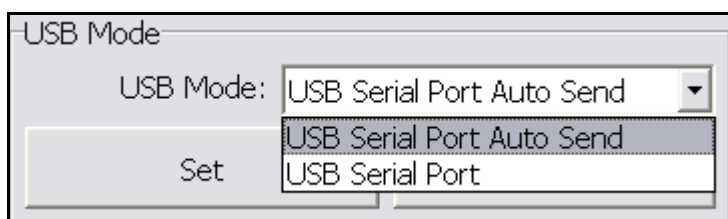
Device response data when received protocol command, and the data will be queued in device buffer.

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.

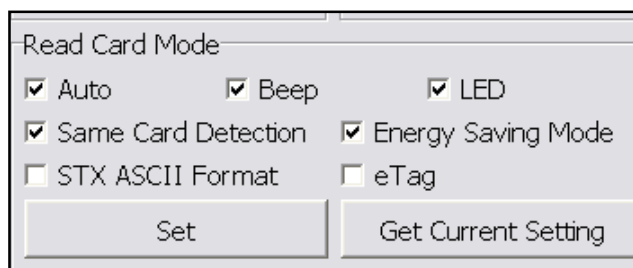
4. **USB Keypad Delay Time**

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.



Read Card Mode

☒ Auto ☒ Beep ☒ LED

☒ Same Card Detection ☒ Energy Saving Mode

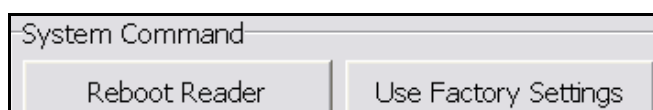
☐ STX ASCII Format ☐ eTag

Set **Get Current Setting**

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.



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**

Send ID Format

ID Format:

<input type="checkbox"/> ID Reverse Bit	<input type="checkbox"/> ID Reverse Byte
<input type="checkbox"/> Add Comma(,)	<input type="checkbox"/> Add Space
<input type="checkbox"/> Add Brackets([])	<input type="checkbox"/> Add Quotation(' ')
<input type="checkbox"/> Add Tab	<input type="checkbox"/> Add Down Arrow
<input type="checkbox"/> Add Ctrl+Enter(LF)	<input checked="" type="checkbox"/> Add Enter(CR)
<input type="checkbox"/> DEC Zero Remove	<input type="checkbox"/> Reverse Digit

Set

Get Current Setting

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'

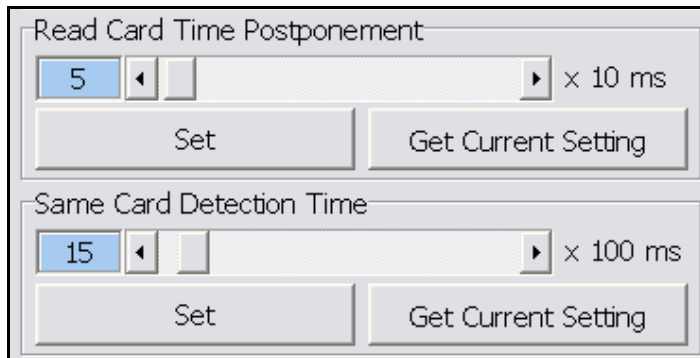
8. Read Card Time Postponement / Same Card Detection Time

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**

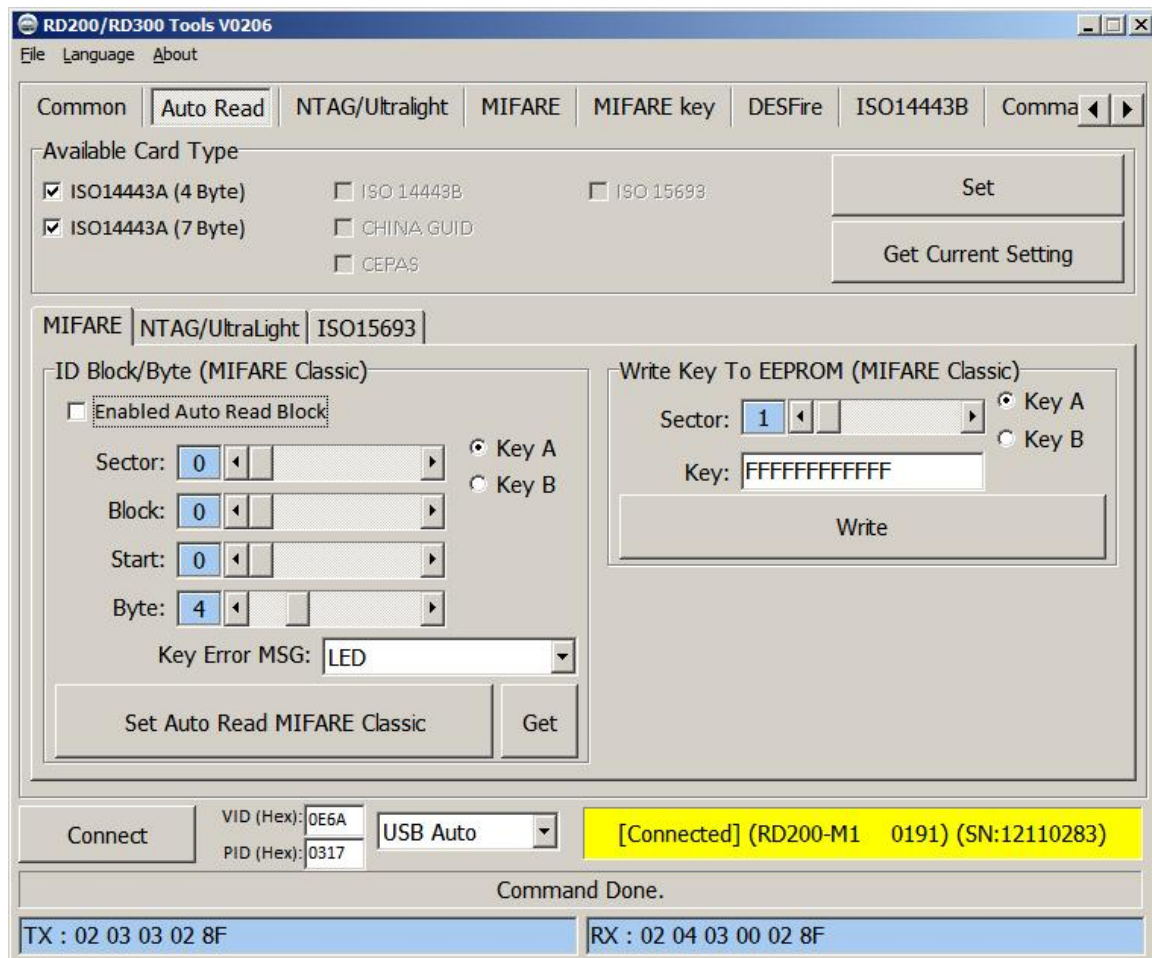
Setting to read current setting from the reader.



The screenshot shows a software window with two sections. The top section is titled "Read Card Time Postponement" and contains a numeric input field with the value "5", a left arrow button, a right arrow button, and the text "x 10 ms". Below this are two buttons: "Set" and "Get Current Setting". The bottom section is titled "Same Card Detection Time" and contains a numeric input field with the value "15", a left arrow button, a right arrow button, and the text "x 100 ms". Below this are two buttons: "Set" and "Get Current Setting".

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

- I Available card type: Setup read card type.
- I 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.



- I 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.

The screenshot shows a software interface for interacting with NTAG/Ultralight NFC tags. The interface is divided into several sections:

- Common** (selected tab), **Auto Read**, **NFC NTAG203/Ultralight**, **MIFARE**, **MIFARE key**, **Command Test**, **Update**
- Card Data Read/Write Test**:
 - Block:** 7
 - Read Card Data:** HEX and ASCII input fields.
 - Write Card Data:** Radio buttons for **HEX** (selected) and **ASCII**. The HEX field contains "FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF" and the ASCII field contains "syris.com/".
 - UID:** 049CB69A402B8000
- Read Card All Data**:
 - Hex data: 00:049CB6A69A402B8071480000E1101200, 04:0103A010440330D1012C5501696C6579, 08:2E636F6D2E74772F6368696E6573652F, 12:30325F626C6F672F30305F6F76657276
 - ASCII data: 堆?@+□qH L?, D?0?,U iley.com.tw/chinese/02_blog/00_overv
 - Read Card All Data** button
 - NO:** 16
- URL Address**:
 - Hex data: E11012000103A010440312D1010E5501 (Block 3-6)
 - ASCII data: iley.com.tw/chin
 - Hex data: 696C65792E636F6D2E74772F6368696E (Block 7-10)
 - Read** and **Write** buttons

For example

Write a URL to NTAG203. (NDEF specification)

<http://ftp.syris.com/index.php?folder=U1ISSVNfUkZJRF9EVkQvUkQyMDA=>

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

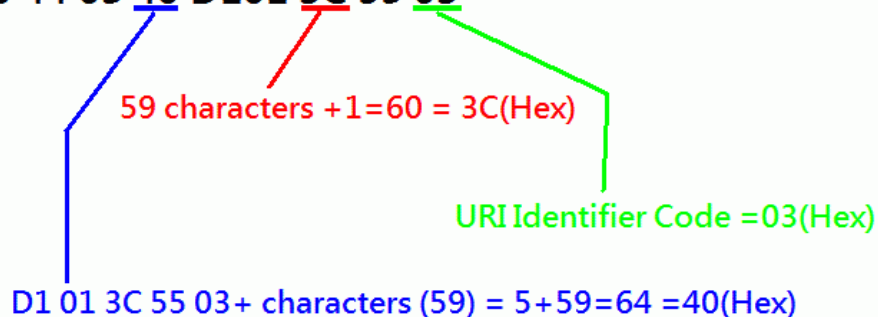
String is "ftp.syris.com/index.php?folder=U1ISSVNfUkZJRF9EVkQvUkQyMDA="

(Total 59 characters)

You need write block with RD200 tool as blow.

BLOCK 3

E11012000103A010 44 03 40 D101 3C 55 03



BLOCK 7

HEX: 6674702E73797269732E636F6D2F696E

=ASCII: ftp.syris.com/in

BLOCK 11

HEX: 6465782E7068703F666F6C6465723D55

=ASCII: dex.php?folder=U

BLOCK 15

316C5353564E66556B5A4A5246394556

=ASCII: 1ISSVNfUkZJRF9EV

<http://ftp.syris.com/index.php?folder=U1ISSVNfUkZJRF9EVkQvUkQyMDA=>

BLOCK 19

6B5176556B51794D44413D0000000000

=ASCII: kQvUkQyMDA=

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.

The screenshot shows a software interface with several tabs: Common, Auto Read, NFC NTAG203/Ultralight, MIFARE (selected), MIFARE key, Command Test, and Updat. The MIFARE tab is active, displaying controls for card data read/write tests. On the left, there are sections for 'Card Data Read/Write Test' and 'Read Card All Data'. The 'Card Data Read/Write Test' section includes fields for Sector (1), Block (0), and Key (FFFFFFFF), with radio buttons for Key A and Key B, and a checkbox for EEPROM. Below these are fields for HEX and ASCII data, and a 'Read Card Data' button. The 'Read Card All Data' section has a large blue area for data display, a 'Read Card All Data' button, and a 'Read Write Card Loop' button. On the right, there are input fields for 'NO' (16) and 'NUM' (3).

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 the software. The 'Write Key To Card' section on the left includes a 'Sector' dropdown set to '1', an 'Old key' field with 'FFFFFFFF' and radio buttons for 'Key A' and 'Key B', a 'New key' section with 'Key A' and 'Key B' fields both set to 'FFFFFFFF', an 'Access bits' field set to 'FF078069', and a large 'Issue MIFARE Card' button. The right side shows 'Access bits (key)' for 'Block 0', 'Block 1', and 'Block 2'. Each block has four sub-sections: 'Read', 'Write', 'INC', and 'DEC', each with radio buttons for 'A/B', 'B', and 'never'. Additionally, there are 'Key A' and 'Key B' sections for each block, each with 'Read' and 'Write' radio buttons for 'A', 'B', and 'never'.

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 of the 'Write Key To Card' section. It shows the 'Sector' dropdown set to '1', the 'Old key' field with 'FFFFFFFF' and 'Key A' selected, the 'New key' section with 'Key A' and 'Key B' fields both set to 'FFFFFFFF', the 'Access bits' field set to 'FF078069', and the 'Issue MIFARE Card' button.

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 software interface 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 of these sub-sections has three radio button options: A/B, B, and never. Additionally, there are two sections for Key A and Key B, each with Read and Write sub-sections, each having three radio button options: A, B, and never. The interface is designed for configuring access permissions for different blocks and keys.

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
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
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

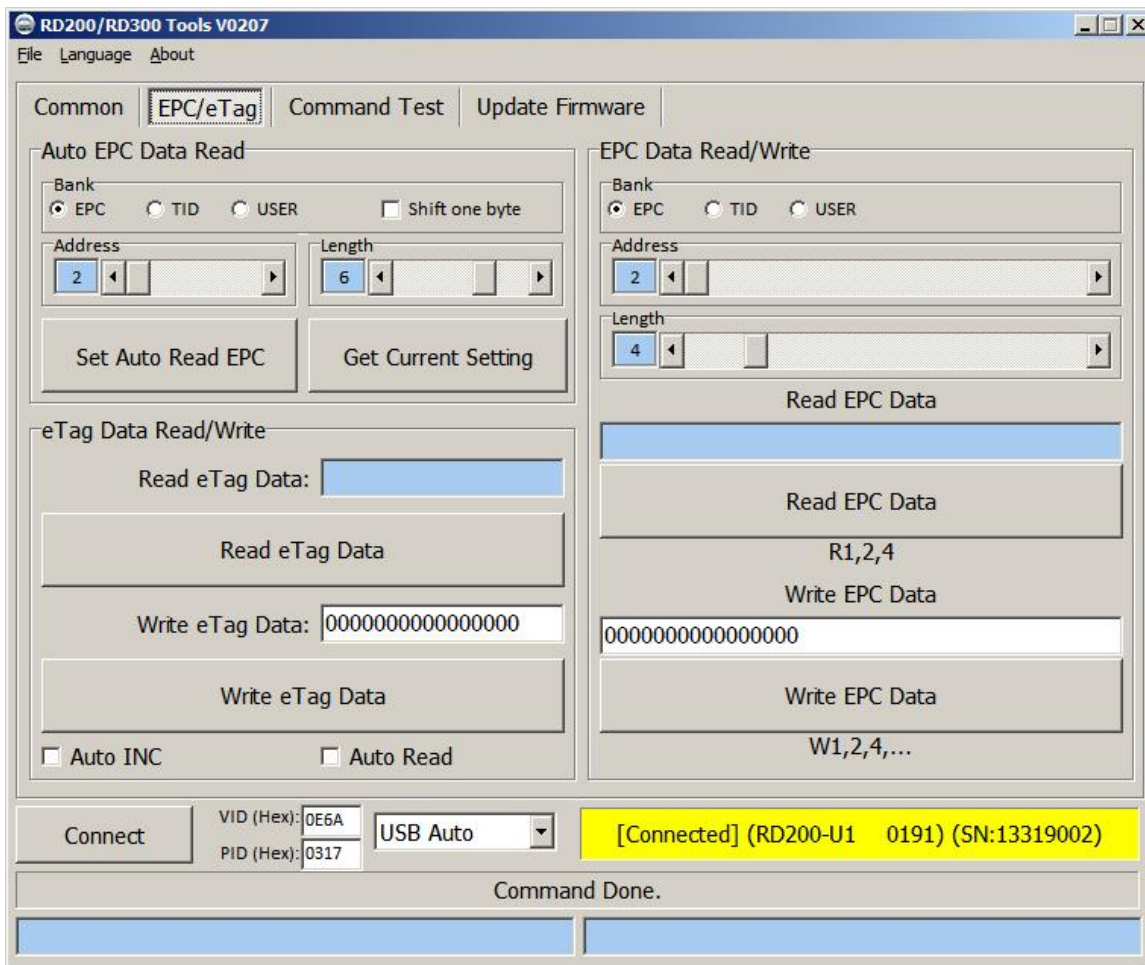
Key	Action	Read	Write
Key A	Read	<input checked="" type="radio"/> never	<input checked="" type="radio"/> A
	Write	<input type="radio"/> B	<input type="radio"/> never
Access bits	Read	<input checked="" type="radio"/> A	<input checked="" type="radio"/> A
	Write	<input type="radio"/> A/B	<input type="radio"/> never
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							
<input checked="" type="checkbox"/> EM/TEMIC - 125 kHz		<input type="checkbox"/> SYRIS - 125 kHz		<input type="checkbox"/> SECURITY - 125 kHz			
<input type="checkbox"/> 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. 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.

The screenshot shows the 'RD200/RD300 Tools V0206' application window. The 'DESFire' tab is selected in the top menu. The 'DESFire Command Test' section is active, displaying the 'ISO14443A Config' sub-section. On the right, there is a checkbox for 'Auto Read Card Disable 10 Sec'. Below this, there are several command options on the left and their corresponding hex values on the right:

Command	Hex Value
DESFire Select+RSTS+PPS	
Send APDU (First)	90 60 00 00 00
Send APDU (Second)	90 AF 00 00 00
Send APDU (Third)	90 AF 00 00 00
Transparent With CRC	0A 00 90 60 00 00 00
Transparent Without CRC	26

At the bottom, there is a 'Connect' button, fields for 'VID (Hex): 0E6A' and 'PID (Hex): 0317', a 'USB Auto' dropdown menu, and a yellow status bar displaying '[Connected] (RD200-M1 0191) (SN:12110283)'. Below the status bar is a 'Command Error!' label and two text boxes for 'TX : 02 01 30' and 'RX : '.

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

Provide to test ISO 14443B command.

The screenshot shows the 'RD200/RD300 Tools V0206' application window. The 'ISO14443B' tab is selected in the top menu. The 'ISO14443B Command Test' section is active, displaying a list of commands on the left and their corresponding hex values on the right. The commands are: Request, Transparent #1, Transparent #2, Transparent #3, Get China Card GUID, and Get CEPAS Card CID. The hex values for the first three are 05 00 00, 1D 00 00 00 00 00 00 00, and 0D 00 00 00 00 respectively. Below the command list, there are fields for VID (Hex): 0E6A, PID (Hex): 0317, and a USB Auto dropdown menu. A yellow status bar indicates '[Connected] (RD200-M1 0191) (SN:12110283)'. At the bottom, there is a 'Command Error!' section with TX and RX fields.

Command	Hex Value
Request	05 00 00
Transparent #1	1D 00 00 00 00 00 00 00
Transparent #2	0D 00 00 00 00
Transparent #3	
Get China Card GUID	
Get CEPAS Card CID	

VID (Hex): 0E6A
PID (Hex): 0317
USB Auto

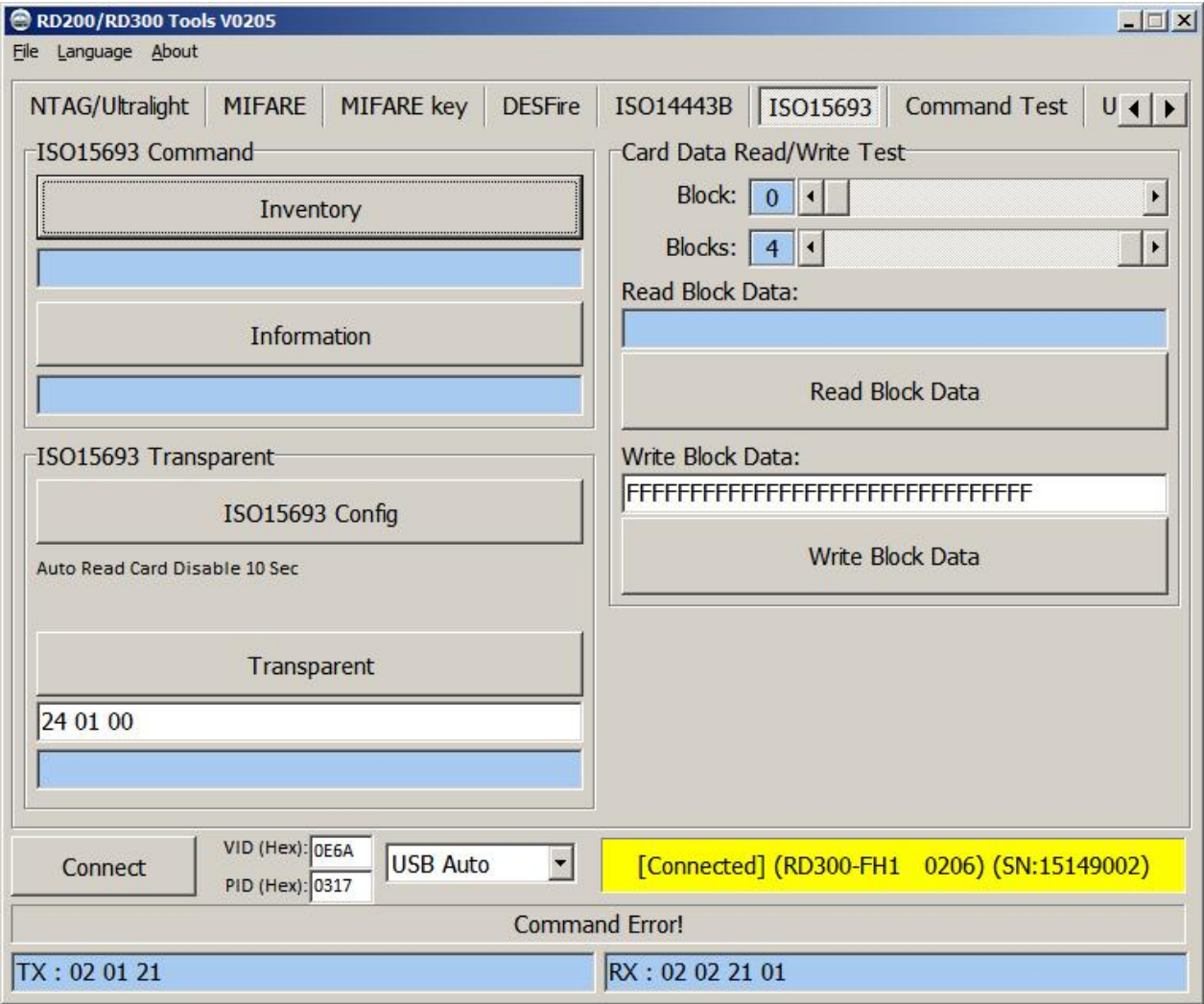
[Connected] (RD200-M1 0191) (SN:12110283)

Command Error!

TX : 02 01 30
RX :

ISO 15693 (RD300-H series supported)

Provide to test ISO 15693 command.



DESFire (RD300-DES1 supported)

The screenshot shows the 'RD100/RD200/RD300 Tools V0251' application window. The 'DESFire' tab is selected, showing options for reading and writing file data and auto-reading file/block data. The 'Read / Write File Data' section includes fields for UID, File ID, BlockID, KeyNo, and a Key field. The 'Auto read file/block (DESFire)' section includes an 'Enabled' checkbox, File ID, BlockID, KeyNo, Start, and Byte fields, and a 'Key Error Message' dropdown. The 'Write key to EEPROM' section includes a 'No.' dropdown and a key field. The bottom status bar shows 'Command Done.' and a hex dump of TX and RX data.

RD100/RD200/RD300 Tools V0251

File Language About

Common Option **DESFire** Command Test Update Firmware

Read / Write File Data

UID

File ID: BlockID: KeyNo:

Key:

Read Block Data :

Write Block Data:

Old Key:

Auto read file/block (DESFire)

☐ Enabled

File ID: BlockID: KeyNo:

Start:

Byte:

Key Error Message:

Write key to EEPROM

No:

Connect VID (Hex): PID (Hex): USB Auto

[Connected] (RD300-DES1 0236) (SN:14300007)

Command Done.

TX : 02 17 9F 16 01 B2 01 01 00 00 00 00 00 00 00 00 RX : 02 27 9F 00 25 01 B2 00 00 00 00 00 00 00 00 00

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".)

[illegible]

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.

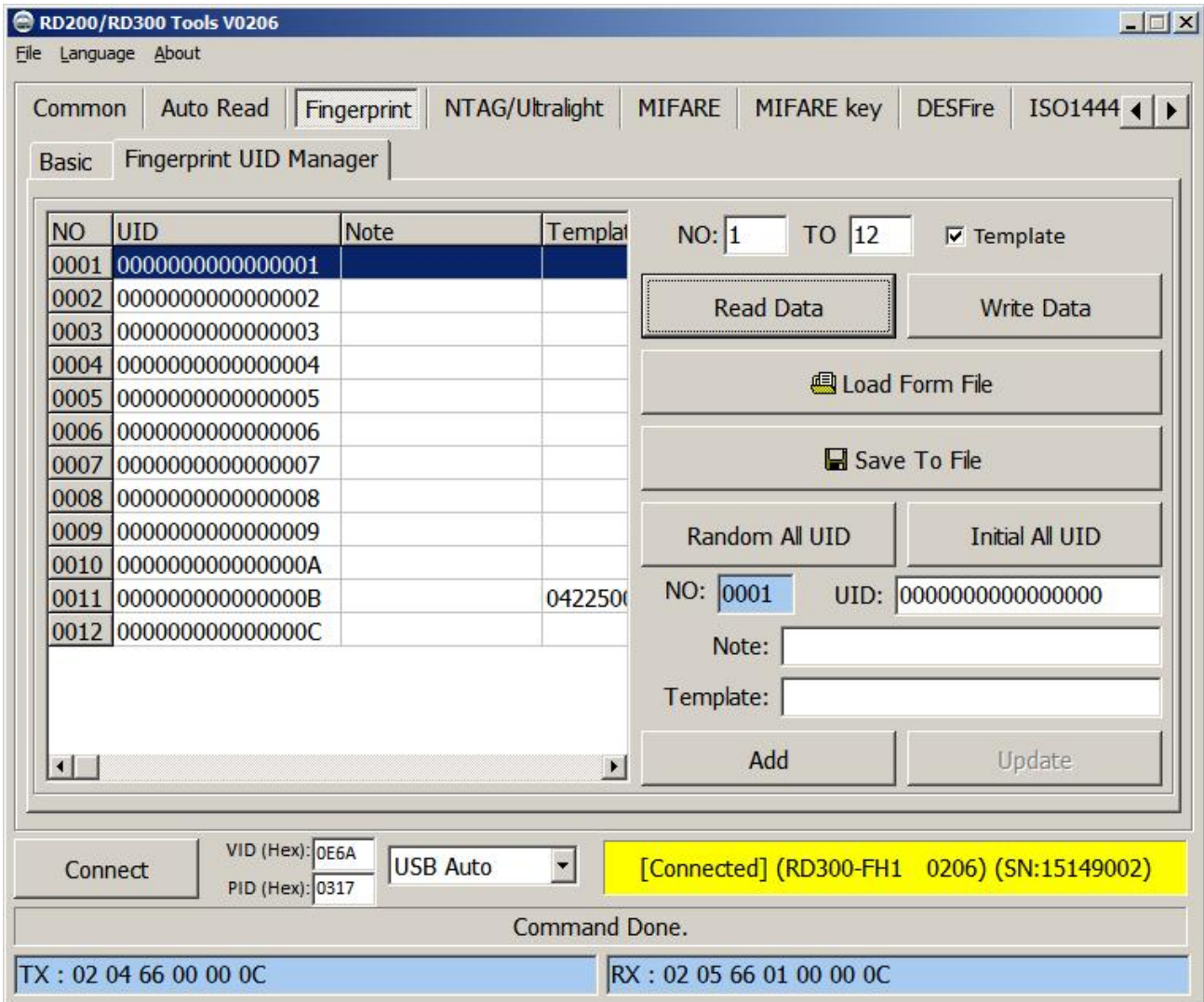
7. Format card: Input correct old key and new key to format card to clear all data and change format key.

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

[illegible]

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)

B. Fingerprint UID Manager

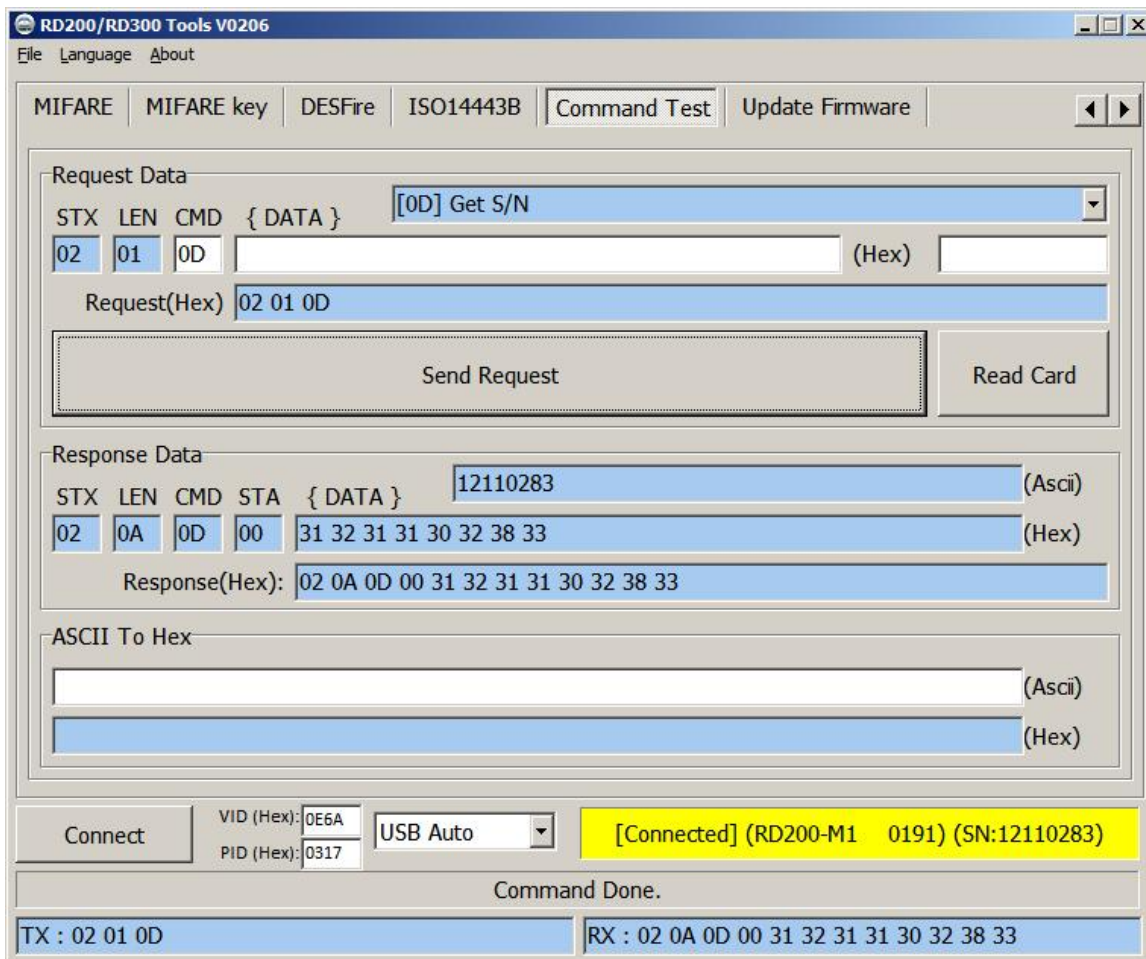
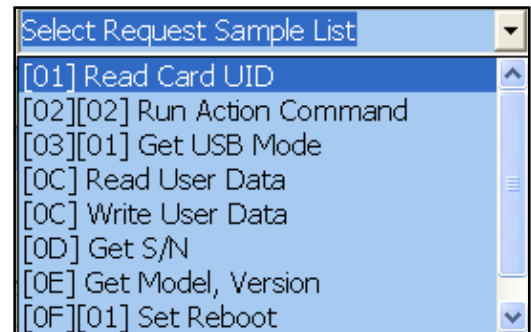


1. **Read Data:** Select number range to read fingerprint database in reader.
2. **Write Data:** Select number range to write fingerprint database in reader.
3. **Load Form File:** Load "uid.txt" file.
4. **Save to File:** Save current data to txt file.(uid.txt)
5. **Random All UID:** Set fingerprint's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

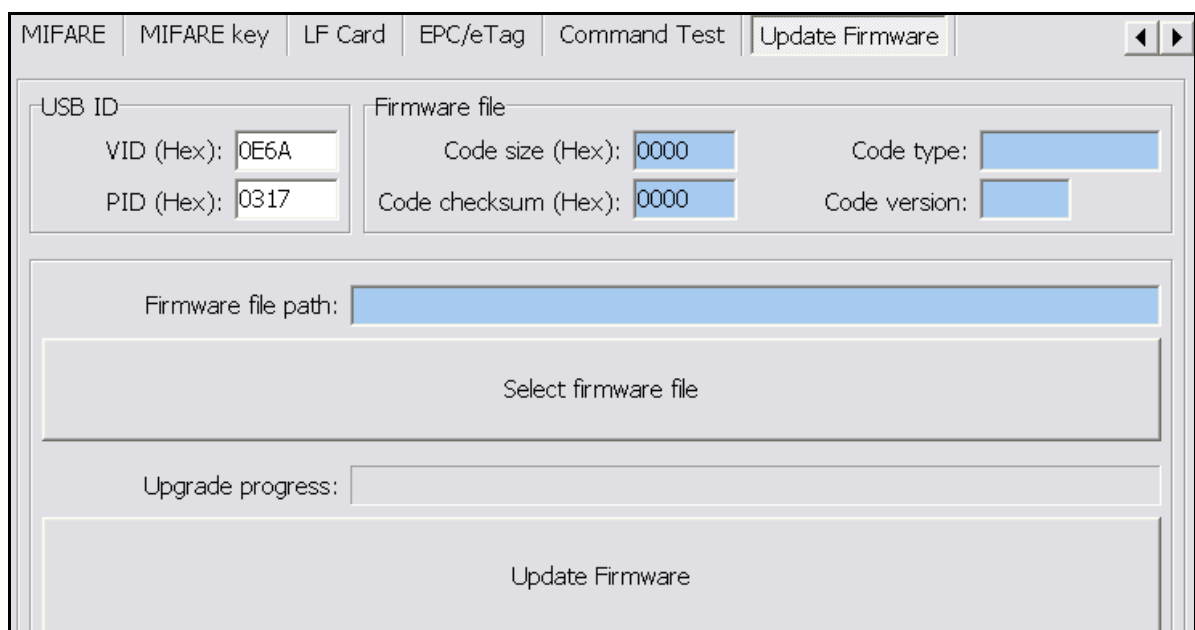


The firmware update steps as below:

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 does 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.