JMY600 Series IC Card Module

ICODE SLIX2 Custom Commands Operation Guide

（Revision 1.00）

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2022/6/13

Please read this manual carefully before using. If any problem, please feel free to contact us, we will offer a satisfied answer ASAP.

Contents

1 Overview

This article introduces in detail the operation method and sequence of using JMY600 series card reader module to operate ICODE SLIX2 CUSTOM COMMANDS and basic card functions. You can quickly master the use of ICODE SLIX2 electronic label customization instructions by reading this manual. This manual is intended for programmers who use JMY600 series RFID modules. We also have example codes of communication protocols, which can be found on Jinmuyu's website. If you still have any problems while writing the program, please feel free to contact our technical support. Or send an email to: jinmuyu@vip.sina.com and we will give you a satisfactory answer.

2 Features and benefits

- Contactless transmission of data and supply energy (no battery needed)
- Operating distance: up to 1.5 m (depending on antenna geometry)
- Operating frequency: 13.56 MHz (ISM, world-wide licence freely available)
- Fast data transfer: up to 53 kbit/s
- High data integrity: 16-bit CRC, framing
- True anticollision
- Electronic Article Surveillance (EAS)
- Application Family Identifier (AFI) supported
- Data Storage Format Identifier (DSFID)
- ENABLE PRIVACY command with 32-bit Privacy password
- DESTROY SLIX2 command with 32-bit Destroy password
- Additional fast anticollision read
- Persistent quiet mode to enable faster inventory speed
- Write distance equal to read distance
- 2560 bits user memory, organized in 80 blocks of 4 bytes each (last block reserved for counter feature)
- 50 years data retention
- Write endurance of 100000 cycles
- Unique identifier for each device (8 byte)
- 32 byte originality signature
- Lock mechanism for each user memory block (write protection)
- Lock mechanism for DSFID, AFI, EAS
- Password (32-bit) protected memory management for Read access
- Password (32-bit) protected memory management for Write access
- Password (32-bit) protected Label Destroy
- Password (32-bit) protected Privacy Mode
- Password (32-bit) protected EAS and AFI functionality
- 16 bit counter (optionally password protected with the read and write password)

3 Memory organization

The 2560 bit user accessible EEPROM memory is divided into 80 blocks. A block is the smallest access unit. Each block consists of 4 bytes (1 block = 32 bits). Bit 0 in each byte represents the least significant bit (LSB) and bit 7 the most significant bit (MSB), respectively.

The entire memory is divided into 3 parts:

- Configuration area
  - Within this part of the memory all required information is stored, such as UID, write protection, access control information, passwords, AFI and EAS and originality signature. This memory area cannot be directly accessed.
- User memory
  - Within the 2528 bit memory (79 blocks) area the user data are stored. Direct read/ write access to this part of the memory is possible depending on the related security and write protection conditions.
- 16 bit counter
  - The last block of the EEPROM memory (block 79) contains the 16 bit counter and the counter password protection flag.

Block	Byte 0	Byte 1	Byte 2	Byte 3	Description
-					Configuration area for internal use
0					User memory: 79 blocks, 4 bytes each, 316 bytes in total.
1					
2					
3					
:	:	:	:	:	
76					
77					
78					
79	C0	C1	0x00	PROT	Counter

Only Blocks 0 to 79 can be addressed with read and write commands.

Remark: Block 79 contains the 16 bit counter and can not be used to store user data. READ and WRITE commands to that block require special data considerations (refer to section "16 bit counter feature").

4 Card Operation

4.1 Example of basic card operation

Please refer to the "JMY600 series card reader module ISO15693 electronic label operation guide V1.12.pdf" manual.

4.2 Custom Commands operation

4.2.1 Basic Instructions

1） In this example, most of the instructions are in select mode, which helps to reduce the packet size of the transmission.

2）Request flags

Request flags 1 to 4 definitions

Bit Nb	Flag name	State	Description
Bit 1	Sub-carrier_flag	0	A single sub-carrier frequency shall be used by the VICC
		1	Two sub-carriers shall be used by the VICC
Bit 2	Data_rate_flag	0	Low data rate shall be used
		1	High data rate shall be used
Bit 3	Inventory_flag	0	Flags 5 to 8 meaning is according to table 4
		1	Flags 5 to 8 meaning is according to table 5
Bit 4	Protocol Extension_flag	0	No protocol format extension
		1	Protocol format is extended. Reserved for future use

Note: 1. Sub-carrier_flag refers to the VICC-to-VCD communication as specified in ISO/IEC 15693-2.

2. Data_rate_flag refers to the VICC-to-VCD communication as specified in ISO/IEC 15693-2.

Request flags 5 to 8 definition when inventory flag is NOT set

Bit Nb	Flag name	State	Description
Bit 5	Select_flag	0	Request shall be executed by any VICC according to the setting of Address_flag
		1	Request shall be executed only by VICC in selected state
Bit 6	Address_flag	0	Request is not addressed. UID field is not present. It shall be executed by any VICC.
		1	Request is addressed. UID field is present. It shall be executed only by the VICC whose UID matches the UID specified in the request.
Bit 7	Option_flag	0	Meaning is defined by the command description. It shall be set to 0 if not otherwise defined by the command.
		1	Meaning is defined by the command description.
Bit 8	RFU	0	Shall be set to 0.

Note: if the Select_flag is set to 1, the Address_flag shall be set to 0 and the UID field shall not be present in the request.

Request flags 5 to 8 definition when inventory flag is set

Bit Nb	Flag name	State	Description
Bit 5	AFI_flag	0	AFI field is not present
		1	AFI field is present
Bit 6	Nb_slots_flag	0	16 slots
		1	1 slot
Bit 7	Option_flag	0	Meaning is defined by the command description. It shall be set to 0 if not otherwise defined by the command.
		1	Meaning is defined by the command description.
Bit 8	RFU	0	Shall be set to 0.

3）Response flags

Response flags 1 to 8 definitions

Bit Nb	Flag name	State	Description
Bit 1	Error_flag	0	No error
		1	Error detected. Error code is in the "Error" field.
Bit 2	RFU		Shall be set to 0.
Bit 3	RFU		Shall be set to 0.
Bit 4	Extension_flag	0	No protocol format extension.
		1	Protocol format is extended. Reserved for future use.
Bit 5	RFU		Shall be set to 0.
Bit 6	RFU		Shall be set to 0.
Bit 7	RFU		Shall be set to 0.
Bit 8	RFU		Shall be set to 0.

4）Response error code

Response error code definition

Error code	Meaning
'01'	The command is not supported, i.e. the request code is not recognised.
'02'	The command is not recognised, for example: a format error occurred.
'03'	The option is not supported.
'0F'	Unknown error.
'10'	The specified block is not available (doesn't exist).
'11'	The specified block is already -locked and thus cannot be locked again
'12'	The specified block is locked and its content cannot be changed.
'13'	The specified block was not successfully programmed.
'14'	The specified block was not successfully locked.
'A0' – 'DF'	Custom command error codes
all others	RFU

Note: If the VICC does not support error codes listed in table 7, it shall answer with the error code '0F' (unknown error).

5) Password identifier

Key ID and default value

Password identifier	Password	Default(4Bytes)
01h	Read	00000000h
02h	Write	00000000h
04h	Privacy	0F0F0F0Fh
08h	Destroy	0F0F0F0Fh
10h	EAS/AFI	00000000h

4.2.2 Read and write protection permission setting and testing

- Inventory：

  Card search operation

  TransPort input：5C 00

  Send：00 05 00 5C 00 59

  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

  Card UID：EA E8 D1 18 08 01 04 E0

  IC mfg code: 04

- Select：

  The request format (Flags) in the subsequent command specifies the VICC in the selected state to execute the command to reduce the size of the transmission packet.

TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0（request format Flag，CMD，UID）

Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B

Receive：00 05 01 7E 00 7A（response format Flag）

- Get Random Number

Get Random Number Request format

SOF	Flags	CMD	IC Mfg code	UID	CRC16	EOF
-	8bits	8bits	8bits	64bits	16bits	-
-	See section 4.2.1 Request Format for details.	0xB2		Optional, determined by Flags.	The module is automatically calculated, no need to add in the instruction.	-

GET RANDOM NUMBER response when Error_flag set

SOF	Flags	Error code	CRC16	EOF
-	8 bits	8 bits	16 bits	-
	See section 4.2.1 Response Format for details.	For details, please refer to Chapter 4.2.1 Error Codes.	The module is automatically verified and does not return in the response.	

GET RANDOM NUMBER response format when Error_flag NOT set

SOF	Flags	Random number	CRC16	EOF
-	8 bits	16 bits	16 bits	-
	See section 4.2.1 Response Format for details.		The module is automatically verified and does not return in the response.	

Note: See the ICODE SLIX2 datasheet Custom commands chapter for details, and other commands will not be listed one by one.

TransPort input：7E 00 04 12 B2 04（request format Flag，CMD，IC mfg code）

Send：00 09 00 7E 00 04 12 B2 04 D7

Receive：00 07 01 7E 00 44 B1 8D

Random Number：44 B1

- Set Read Password：

Authentication card read key.

Read keyID：0x01

key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

Example： 0x00000000 XOR 0x44B144B1 = 0x44B144B1

TransPort inout：7E 00 04 12 B3 04 01 44 B1 44 B1
Send：00 0E 00 7E 00 04 12 B3 04 01 44 B1 44 B1 D0
Receive：00 05 01 7E 00 7A

- Set Write Password：

  Authentication card write key
  Write keyID：0x02
  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}
  Example： 0x00000000 XOR 0x44B144B1 = 0x44B144B1
  TransPort input：7E 00 04 12 B3 04 02 44 B1 44 B1
  Send：00 0E 00 7E 00 04 12 B3 04 02 44 B1 44 B1 D3
  Receive：00 05 01 7E 00 7A

- Protect Page

  Set protection permissions
  Note: This command requires authentication of read and write keys
  Example：
  0x14: The page pointer address is protected, and the user memory is divided into PageL (0~19 blocks) and PageH (20~79 blocks).
  0x10： To protect permissions, PageL has no permission settings, and PageH uses Read Password protection.

  TransPort input：7E 00 04 12 B6 04 14 10
  Send：00 0B 00 7E 00 04 12 B6 04 14 10 D5
  Receive：00 05 01 7E 00 7A

- Lock Page Protection Comdition

  Locked page protection status, the protection status cannot be changed after locking. After this state is set, it cannot be restored and can be omitted during testing.
  TransPort input：7E 00 04 12 B7 04 14
  Send：00 0A 00 7E 00 04 12 B7 04 14 C5
  Receive：00 05 01 7E 00 7A

- Card power off and search

- Inventory：

  Search Card operation
  TransPort input：5C 00
  Send：00 05 00 5C 00 59
  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Write Blocks(0x00~0x03)

  TransPort input：55 00 04 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11
  Send：00 16 00 55 00 04 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 47

Receive：00 04 01 55 50

- Read Blocks (0x00~0x03)
  TransPort input：54 00 04
  Send：00 06 00 54 00 04 56
  Receive：00 14 01 54 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 41

- PageL is unprotected, and the direct read and write test is successful.

- Write Blocks(0x14~0x17)
  TransPort input：55 14 04 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11
  Send：00 16 00 55 14 04 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 53
  Receive：00 04 01 AA AF (fail)

- Read Blocks (0x14~0x17)
  TransPort input：54 14 04
  Send：00 06 00 54 14 04 42
  Receive：00 04 01 AB AE (fail)

- PageH is protected, and the read and write tests fail before certification

- Select：
  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0
  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B
  Receive：00 05 01 7E 00 7A

- Get Random Number
  Get random number
  TransPort input：7E 00 04 12 B2 04
  Send：00 09 00 7E 00 04 12 B2 04 D7
  Receive：00 07 01 7E 00 FE 2E A8

  Random Number：FE 2E

- Set Read Password：
  Authentication card read key, the factory default card read key is 4 bytes 0x00.
  Read key ID：0x01
  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}
  Example： 0x00000000 XOR 0xFE2EFE2E = 0xFE2EFE2E
  TransPort input：7E 00 04 12 B3 04 01 FE 2E FE 2E
  Send：00 0E 00 7E 00 04 12 B3 04 01 FE 2E FE 2E D0
  Receive：00 05 01 7E 00 7A

- Write Blocks(0x14~0x17)

TransPort input：55 14 04 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11
Send：00 16 00 55 14 04 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 53
Receive：00 04 01 55 50 (success)

- Read Blocks (0x14~0x17)
  TransPort input：54 14 04
  Send：00 06 00 54 14 04 42
  Receive：00 14 01 54 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 41 (success)

4.2.3 Key modification locking test

- Inventory：
  Card search operation
  TransPort input：5C 00
  Send：00 05 00 5C 00 59
  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：
  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0
  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B
  Receive：00 05 01 7E 00 7A

- Get Random Number
  Get Random Number
  TransPort input：7E 00 04 12 B2 04
  Send：00 09 00 7E 00 04 12 B2 04 D7
  Receive：00 07 01 7E 00 1D 88 ED

  Random Number：1D 88

- Set Read Password：
  Authentication Card Read Key
  Read key ID：0x01
  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}
  Example： 0x00000000 XOR 0x1D881D88 = 0x1D881D88
  TransPort input：7E 00 04 12 B3 04 01 1D 88 1D 88
  Send：00 0E 00 7E 00 04 12 B3 04 01 1D 88 1D 88 D0
  Receive：00 05 01 7E 00 7A

- Write Read Password：
  Set the card reading key
  Read key ID：0x01
  key data：4 bytes plaintext, example set to 0x11111111
  TransPort input：7E 00 04 12 B4 04 01 11 11 11 11
  Send：00 0E 00 7E 00 04 12 B4 04 01 11 11 11 11 D7

Receive：00 05 01 7E 00 7A

Note: After modifying the card key, you need to re-obtain the random number and authenticate.

- Read Blocks (0x14~0x17)

  TransPort input：54 14 04

  Send：00 06 00 54 14 04 42

  Receive：00 04 01 AB AE (fail)

- Get Random Number

  Get Random Number

  TransPort input：7E 00 04 12 B2 04

  Send：00 09 00 7E 00 04 12 B2 04 D7

  Receive：00 07 01 7E 00 46 FB C5

  Random Number：46 FB

- Set Read Password：

  Authentication Card Reading Key

  Red keyID：0x01

  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

  Example： 0x11111111 XOR 0x46FB46FB = 0x57EA57EA

  TransPort input：7E 00 04 12 B3 04 01 57 EA 57 EA

  Send：00 0E 00 7E 00 04 12 B3 04 01 57 EA 57 EA D0

  Receive：00 05 01 7E 00 7A

- Read Blocks (0x14~0x17)

  TransPort input：54 14 04

  Send：00 06 00 54 14 04 42

  Receive：00 14 01 54 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 41 (success)

- Lock the write key testing

- Get Random Number

  Get Random Number

  TransPort input：7E 00 04 12 B2 04

  Send：00 09 00 7E 00 04 12 B2 04 D7

  Receive：00 07 01 7E 00 BD 3B FE

  Random Number：BD 3B

- Set Write Password：

  Authentication card write key

Write keyID：0x02

key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

Example： 0x00000000 XOR 0xBD3BBD3B = 0xBD3BBD3B

TransPort input：7E 00 04 12 B3 04 02 BD 3B BD 3B

Send：00 0E 00 7E 00 04 12 B3 04 02 BD 3B BD 3B D3

Receive：00 05 01 7E 00 7A

- Lock Password

  Lock the card writing key

  Write keyID：0x02

  TransPort input：7E 00 04 12 B5 04 02

  Send：00 0A 00 7E 00 04 12 B5 04 02 D1

  Receive：00 05 01 7E 00 7A

- Write Write Password：

  Set the card write key

  Write keyID：0x02

  Key data: 4 bytes plaintext, example set to 0x11111111

  TransPort input：7E 00 04 12 B4 04 02 11 11 11 11

  Send：00 0E 00 7E 00 04 12 B4 04 02 11 11 11 11 D4

  Receive：00 06 01 7E 01 0F 77（The key is locked, modifying the key fails, the response is correct）

The modified key test is completed, and the other key processes are the same, so they are not listed one by one.

4.2.4 Privacy Mode Test

- Inventory：

  Card search operation

  TransPort input：5C 00

  Send：00 05 00 5C 00 59

  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：

  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0

  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B

  Receive：00 05 01 7E 00 7A

- Get Random Number

  Get Random Number

  TransPort input：7E 00 04 12 B2 04

  Send：00 09 00 7E 00 04 12 B2 04 D7

  Receive：00 07 01 7E 00 A5 D3 0E

Random Number：A5 D3

- ENABLE PRIVACY

  Default key：0x0F0F0F0F

  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

  Example： 0x0F0F0F0F XOR 0xA5D3A5D3 = 0x AADCAADC

  TransPort input：7E 00 04 12 BA 04 AA DC AA DC

  Send：00 0D 00 7E 00 04 12 BA 04 AA DC AA DC DB

  Receive：00 05 01 7E 00 7A

- The card is powered off and the card is searched again

  Card search operation

  TransPort input：5C 00

  Send：00 05 00 5C 00 59

  Receive：00 04 01 A3 A6（Failed, entered privacy mode）

- Set the module card reader type to ISO15693 mode

  TransPort input：70 02

  Send：00 05 00 70 02 77

  Receive：00 04 01 70 75

- Turn on the antenna

  TransPort input：11 01

  Send：00 05 00 11 01 15

  Receive：00 04 01 11 14

- Get Random Number

  Get a random number; note that the request Flags is set to 02

  TransPort input：7E 00 04 02 B2 04

  Send：00 09 00 7E 00 04 02 B2 04 C7

  Receive：00 07 01 7E 00 E9 F0 61

  Random Number：E9 F0

- Set Privacy Password：

  Authentication card privacy key, note that Request Flags is set to 02

  Red keyID：0x04

  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

  Example： 0x0F0F0F0F XOR 0xE9F0E9F0 = 0xE6FFE6FF

  TransPort input：7E 00 04 02 B3 04 04 E6 FF E6 FF

  Send：00 0E 00 7E 00 04 02 B3 04 04 E6 FF E6 FF C5

  Receive：00 05 01 7E 00 7A

- Inventory

Card search operation
TransPort input：5C 00
Send：00 05 00 5C 00 59
Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76（Success, exit privacy mode）

4.2.5 EAS setup and test

- Inventory：
  Card search operation
  TransPort input：5C 00
  Send：00 05 00 5C 00 59
  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：
  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0
  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B
  Receive：00 05 01 7E 00 7A

- Get Random Number
  Get Random Number
  TransPort input：7E 00 04 12 B2 04
  Send：00 09 00 7E 00 04 12 B2 04 D7
  Receive：00 07 01 7E 00 FC E3 67

  Random Number：FC E3

- Set EAS Password：
  Authenticate EAS key
  KeyID：0x10
  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}
  Example： 0x00000000 XOR 0xFCE3FCE3 = 0xFCE3FCE3
  TransPort input：7E 00 04 12 B3 04 10 FC E3 FC E3
  Send：00 0E 00 7E 00 04 12 B3 04 10 FC E3 FC E3 C1
  Receive：00 05 01 7E 00 7A

- Set EAS：
  Set EAS mode
  TransPort input：7E 00 04 12 A2 04
  Send：00 09 00 7E 00 04 12 A2 04 C7
  Receive：00 05 01 7E 00 7A

- Write EAS ID
  Set EAS ID to 0x22 11
  TransPort input：7E 00 04 12 A7 04 22 11
  Send：00 0B 00 7E 00 04 12 A7 04 22 11 F3

Receive：00 05 01 7E 00 7A

- After the card is powered off, power on again

- Set the module card reader type to ISO15693 mode
  TransPort input：70 02
  Send：00 05 00 70 02 77
  Receive：00 04 01 70 75

- Turn on the antenna
  TransPort input：11 01
  Send：00 05 00 11 01 15
  Receive：00 04 01 11 14

- EAS Alarm：
  EAS alert, does not match EAS ID
  TransPort input：7E 00 04 02 A5 04
  Send：00 09 00 7E 00 04 02 A5 04 D0
  Receive：00 25 01 7E 00 2F B3 62 70 D5 A7 90 7F E8 B1 80 38 D2 81 49 76 82 DA 9A 86 6F AF 8B B0 F1 9C D1 12 A5 72 37 EF DA

- EAS Alarm：
  EAS alert, match 1 byte EAS ID, 0x22
  TransPort input：7E 00 06 42 A5 04 08 22
  Send：00 0B 00 7E 00 06 42 A5 04 08 22 BA
  Receive：00 25 01 7E 00 2F B3 62 70 D5 A7 90 7F E8 B1 80 38 D2 81 49 76 82 DA 9A 86 6F AF 8B B0 F1 9C D1 12 A5 72 37 EF DA

- EAS Alarm：
  EAS alert, matching 2-byte EAS ID, 0x2211
  TransPort input：7E 00 06 42 A5 04 10 22 11
  Send：00 0C 00 7E 00 06 42 A5 04 10 22 11 B4
  Receive：00 25 01 7E 00 2F B3 62 70 D5 A7 90 7F E8 B1 80 38 D2 81 49 76 82 DA 9A 86 6F AF 8B B0 F1 9C D1 12 A5 72 37 EF DA

- EAS Alarm：
  EAS alert, matching 2-byte wrong EAS ID, 0x1122
  TransPort input：7E 00 06 42 A5 04 10 11 22
  Send：00 0C 00 7E 00 06 42 A5 04 10 11 22 B4
  Receive：00 04 01 81 84(mistake)

- Cancel EAS

- Inventory：

Card search operation
TransPort input：5C 00
Send：00 05 00 5C 00 59
Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：
  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0
  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B
  Receive：00 05 01 7E 00 7A

- Get Random Number
  Get Random Number
  TransPort input：7E 00 04 12 B2 04
  Send：00 09 00 7E 00 04 12 B2 04 D7
  Receive：00 07 01 7E 00 94 07 EB

  Random Number：94 07

- Set EAS Password：
  Authenticate the EAS key
  KeyID：0x10
  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}
  Example： 0x00000000 XOR 0x94079407 = 0x94079407
  TransPort input：7E 00 04 12 B3 04 10 94 07 94
  Send：00 0E 00 7E 00 04 12 B3 04 10 94 07 94 07 C1
  Receive：00 05 01 7E 00 7A

- Reset EAS
  Exit EAS mode
  TransPort input：7E 00 04 12 A3 04
  Send：00 09 00 7E 00 04 12 A3 04 C6
  Receive：00 05 01 7E 00 7A

- EAS Alarm：
  EAS alert, does not match EAS ID
  TransPort input：7E 00 04 02 A5 04
  Send：00 09 00 7E 00 04 02 A5 04 D0
  Receive：00 04 01 81 84(Failed, indicating that EAS mode has been exited)

4.2.6 16 BIT COUNTER

- Inventory：
  Card search operation
  TransPort input：5C 00
  Send：00 05 00 5C 00 59

Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：

  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0

  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B

  Receive：00 05 01 7E 00 7A

- Get Random Number

  Get Random Number

  TransPort input：7E 00 04 12 B2 04

  Send：00 09 00 7E 00 04 12 B2 04 D7

  Receive：00 07 01 7E 00 C0 58 E0

  Random Number：C0 58

- Set Write Password：

  Authentication card read key

  Red keyID：0x02

  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

  Example： 0x00000000 XOR 0xC058C058 = 0xC058C058

  TransPort input：7E 00 04 12 B3 04 02 C0 58 C0 58

  Send：00 0E 00 7E 00 04 12 B3 04 02 C0 58 C0 58 D3

  Receive：00 05 01 7E 00 7A

- Set the initial value of the counter

  Set the initial value to be 0x1000 (it is forbidden to set it to be 0x0001, 0x0001 is only used for incremental operations), and the write key needs to be authenticated.

  TransPort input：55 4F 01 00 10 00 01(LSB First, 01: Counter increment is protected with password)

  Send：00 0A 00 55 4F 01 00 10 00 01 00

  Receive：00 04 01 55 50

- Read Block(79)

  TransPort input：54 4F 01

  Send：00 06 00 54 4F 01 1C

  Receive：00 08 01 54 00 10 00 01 4C (The value of the counter becomes 0x1000)

- Set Read Password：

  Authentication card read key

  Red keyID：0x01

  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

  Example： 0x00000000 XOR 0xC058C058 = 0xC058C058

  TransPort input：7E 00 04 12 B3 04 01 C0 58 C0 58

  Send：00 0E 00 7E 00 04 12 B3 04 01 C0 58 C0 58 D0

  Receive：00 05 01 7E 00 7A

- The counter is incremented
  Requires authenticated read key
  TransPort input：55 4F 01 01 00 00 00（LSB First）
  Send：00 0A 00 55 4F 01 00 10 00 01 00
  Receive：00 04 01 55 50

- Read Block(79)
  TransPort input：54 4F 01
  Send：00 06 00 54 4F 01 1C
  Receive：00 08 01 54 01 10 00 01 4D (The value of the counter becomes 0x1001)

- The counter is incremented
  TransPort input：55 4F 01 01 00 00 00（LSB First）
  Send：00 0A 00 55 4F 01 00 10 00 01 00
  Receive：00 04 01 55 50

- Read Block(79)
  TransPort input：54 4F 01
  Send：00 06 00 54 4F 01 1C
  Receive：00 08 01 54 02 10 00 01 4E (The value of the counter becomes 0x1002)

4.2.7 STAY QUIET PERSISTENT

In this mode, if the power outage time exceeds the duration, the tag IC will turn to the ready state.

- Inventory：
  Card search operation。
  TransPort input：5C 00
  Send：00 05 00 5C 00 59
  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Stay Quiet Persitent：
  TransPort input：7E 01 00 22 BC 04 EA E8 D1 18 08 01 04 E0
  Send：00 11 00 7E 01 00 22 BC 04 EA E8 D1 18 08 01 04 E0 D2
  Receive：00 04 01 7E 7B

- Inventory：
  Without AFI card search operation
  TransPort input：5C
  Send：00 04 00 5C 58
  Receive：00 04 01 A3 A6（fail）

- Power off and wait a few minutes

- Inventory：

  Without AFI card search operation

  TransPort input：5C

  Send：00 04 00 5C 58

  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

4.2.8 INVENTORY READ

- Set the module card reader type to be ISO15693 mode

  TransPort input：70 02

  Send：00 05 00 70 02 77

  Receive：00 04 01 70 75

- Turn on the antenna

  TransPort input：11 01

  Send：00 05 00 11 01 15

  Receive：00 04 01 11 14

- Inventory Read

  Read blocks 00~05, a total of 6 blocks

  TransPort input：7E 00 04 36 A0 04 00 00 00 05

  Send：00 0D 00 7E 00 04 36 A0 04 00 00 00 05 E0

  Receive：00 1D 01 7E 00 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 55 55 55 55 66 66 66 66 62

- Fast Inventory Read

  Read blocks 00~05, a total of 6 blocks

  TransPort input：7E 00 04 36 A1 04 00 00 00 05

  Send：00 0D 00 7E 00 04 36 A1 04 00 00 00 05 E1

  Receive：00 1D 01 7E 00 44 44 44 44 33 33 33 33 22 22 22 22 11 11 11 11 55 55 55 55 66 66 66 66 62

4.2.9 Other commands

- Inventory：

  Card search operation

  TransPort input：5C 00

  Send：00 05 00 5C 00 59

  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：

  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0

  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B

  Receive：00 05 01 7E 00 7A

- GET NXP SYSTEM INFORMATION

  TransPort input：7E 00 04 12 AB 04

  Send：00 09 00 7E 00 04 12 AB 04 CE

  Receive：00 0C 01 7E 00 14 10 08 7F 35 00 00 35

- READ SIGNATURE

  TransPort input：7E 00 04 12 BD 04

  Send：00 09 00 7E 00 04 12 BD 04 D8

  Receive：00 25 01 7E 00 29 4B AF 46 FF B5 DB 1C 90 B5 D0 4C D8 81 9C A2 2F 5D E9 25 BC C9 31 94 31 48 DF 1E A3 08 55 7C D6

4.2.10 Destroy Mode Operation

- Inventory：

  Card search operation

  TransPort input：5C 00

  Send：00 05 00 5C 00 59

  Receive：00 0D 01 5C 00 EA E8 D1 18 08 01 04 E0 76

- Select：

  TransPort input：7E 00 04 22 25 EA E8 D1 18 08 01 04 E0

  Send：00 10 00 7E 00 04 22 25 EA E8 D1 18 08 01 04 E0 4B

  Receive：00 05 01 7E 00 7A

- Get Random Number

  Get Random Number

  TransPort input：7E 00 04 12 B2 04

  Send：00 09 00 7E 00 04 12 B2 04 D7

  Receive：00 07 01 7E 00 50 A8 80

  Random Number：50 A8

- Set Destroy Password：

  Authentication Destroy key

  KeyID：0x08

  key data processing：Password[31:0] XOR { Rand [15:0]，Rand [15:0]}

  Example： 0x0F0F0F0F XOR 0x50A850A8 = 0x5FA75FA7

  TransPort input：7E 00 04 12 B3 04 08 5F A7 5F A7

  Send：00 0E 00 7E 00 04 12 B3 04 08 5F A7 5F A7 D9

  Receive：00 05 01 7E 00 7A

- Destroy：

  Destroy tags. NOTE: This operation is irreversible.

  TransPort input：7E 00 04 12 B9 04

Send：00 09 00 7E 00 04 12 B9 04 DC

Receive：00 05 01 7E 00 7A

- Card search operation

  TransPort input：5C 00

  Send：00 05 00 5C 00 59

  Receive：00 04 01 A3 A6（failed, deactivated）