MR820
IC Card Reader

General Technical Manual

(Revision 1.00)

Beijing Jinmuyu Electronics Co., Ltd

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

Contents

Document update records

Date	Revision	Update information
March 4, 2024	V1.00	Create new document

1 Introduction

The PC/SC specification was proposed by the PC/SC working group composed of Microsoft and other famous smart card manufacturers in the world. The PC/SC specification is a standard user interface (API) based on the WINDOWS platform, providing an integrated environment from Personal Computer (Personal Computer) to Smart Card (SmartCard). The PC/SC system consists of three main components, which respectively specify the responsibilities of operating system manufacturers, reader/writer (IFD) manufacturers, and smart card (ICC) manufacturers.

As the hardware part of the intermediate link for smart card operation on the PC side, our company's reader/writer provides a simple, efficient and reliable communication method. After installing the CCID driver, connect the USB of the reader/writer to the PC. After inserting the card, the hardware connection between the smart card and the PC can be completed. Customers only need to call the API function of the PC/SC specification based on the WINDOWS platform to complete the operation of the smart card.

Our company's reader/writer is mainly responsible for data communication with the PC/SC interface on the PC side and reading and writing smart cards. The reader/writer supports MIFARE 1K/4K cards, MIFARE UltraLight cards, ISO14443-3 CPU cards and ISO14443-4 CPU cards. Users only need to operate the card according to the communication protocol provided below. Our company also provides test software to complete the PC operation of the smart card.

This series of card readers fully complies with PC/SC standards and is compatible with existing PC/SC card readers from other manufacturers. It uses standard Microsoft CCID drivers to simplify the driver installation process.

1.1 Product pictures (Front and Back)

1.2 Product parameters

Model No.	MR820	
Number of Slots	1 Contactless	MIFARE &NFC & ISO14443 & ISO15693
	1 SAM	ISO/IEC 7816 Class B(3V)
	1 Contact SmartCard	ISO/IEC 7816 Class B(3V)
Operating Systems	Windows XP/7/8/10/11	
Supply Voltage	5V	
Supply Current	50~300mA	
Temperature	-20℃ ~+85℃	
Humidity	5%～93%	
Specification	130mm*86mm*30mm	
Connecting Line	150cm	
LED Status	2 LED, Red and Green	
Buzzer	Monotone	
PC-Linked Mode	PC/SC	
Origin	China	

2 Driver Installation and System Identification

If your PC systems no CCID driver, it will remind you to install the driver when the PC/SC Reader connects with your PC via USB interface at the first time. But no worry, we can offer you the CCID driver, you can get it from our website or we will send it to you by mail.

After installation successfully, it will show you two Smart Card Readers-- "Microsoft Usbccid Smartcard Reader (WUDF)" in your PC Device Manager, like the following picture.

2.1 Contactless Reader

The Reader can Read/Write the Contactless Smart Card and Memory Card within the Antenna fields.

2.2 SAM Reader

Also it can operate ISO7816 SAM cards in the Reader internal SAM slots.

2.3 Device Controller

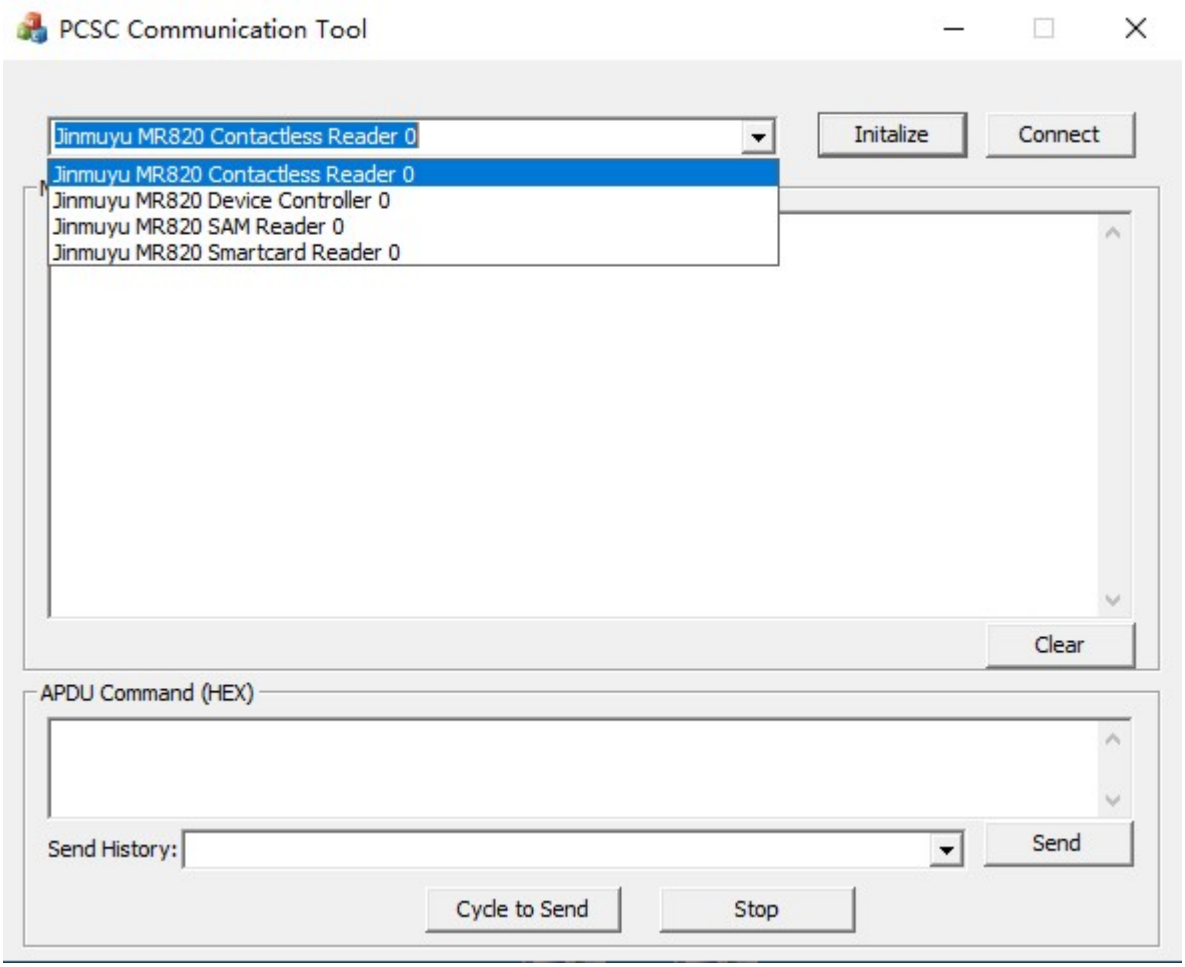
Device controller is the way to operate miscellany. Like LED, Flash and etc.

2.4 Contact SmartCard Controller

Processing contact smart cards

3 PC Software

Connect the reader to the PC, open the PCSC Communication Tool, click Initialize, and 4 card reader devices are recognized.



These 4 devices explain below:

Jinmuyu MR820 Contactless Reader 0: MR820 IC card reader contactless channel

Jinmuyu MR820 Device Controller 0: MR820 IC device control channel

Jinmuyu MR820 SAM Reader 0: MR820 IC card reader SAM channel

Jinmuyu MR820 Smartcard Reader 0: MR820 Contact smart card channel

4 PICC Interface Description

4.1 ATRGeneration

When a PICC that complies with the ISO14443 standard is placed in the card reading area of the card reader and the reader detects the PICC, an ATR will be prepared. When the PC connects to this channel, the reader will send the ATR to PC to identify PICC.

4.2 ATR format for ISO 14443 Part 3 PICCs

Byte No.	Value(Hex)	Designation	Description
0	3B	Initial Header	
1	8N	T0	Higher nibble 8 means no TA1, TB1, and TC1 only TD1 is following. Lower nibble n is the number of historical bytes (HistByte 0 to HistByte n-1).
2	80	TD1	Higher nibble 8 means no TA2, TB2, and TC2 only TD2 is following. Lower nibble 0 means T = 0.
3	01	TD2	Higher nibble 0 means no TA3, TB3, TC3, TD3 following. Lower nibble 1 means T = 1.
4 to 3+N	80	T1	Category indicator byte, 80 means A status indicator may be present in an optional COMPACT-TLV data object.
	4F	Tk	Application identifier Presence indicator
	0C		Length
	RID		Registered application provider identifier:(RID) # A0 00 00 03 06h
	SS		Byte for Standard
	C0…C1		Bytes for Card Name
	00000000h	RFU	RFU # 00 00 00 00h
4+N	UU	TCK	XOR of all the bytes T0 to Tk

Since the MIFARE card is an ISO14443-3 card, the card itself does not have an ATR, so the ATR is assembled according to PC/SC specifications.

For example:

MIFARE S50: 3B8F8001804F0CA000000306030001000000006A

MIFARE Ultralight: 3B8F8001804F0CA000000306030003000000006 8

4.3 ATR format for ISO 14443 Part 4 PICCs

Byte Nr	Value(Hex)	Designation	Description
0	3B	Initial Header	
1	8N	T0	Higher nibble 8 means no TA1, TB1, and TC1 only TD1 is following. Lower nibble n is the number of historical bytes (HistByte 0 to HistByte n-1).
2	80	TD1	Higher nibble 8 means no TA2, TB2, and TC2 only TD2 is following. Lower nibble 0 means T = 0.
3	01	TD2	Higher nibble 0 means no TA3, TB3, TC3, TD3 following. Lower nibble 1 means T = 1.
4	XX	T1	Historical bytes: ISO14443A: The historical bytes from ATS response. Refer to the ISO14443-4 specification. ISO14443B: The higher layer response from the ATTRIB response. Refer to the ISO14443-3 specification.
to 3+N	XX xx XX	Tk	
4+N	UU	TCK	XOR of bytes T0 to Tk

For ISO14443-4 smart cards, this ATR does not come from the card, but is assembled. For the ATR of the card, you can use the GetData command to obtain it.

TYPE A smart card: 3B 8B 80 01 20 90 00 00 00 00 00 26 1E 9A A6 BE

TYPE B smart card: 3B 8C 80 01 50 20 16 21 EE 55 55 55 55 00 81 C1 E4

5 Contactless Reader Commands

5.1 Operation Prepare

When operating a contactless IC card, please first confirm that the card is supported by this card reader.

Connect the card reader to the computer and place the card in the card reading area of the card reader. After the card reader finds the card, there will be a sound and light prompt. Start the PC/SC operating software we provide: "PCSC Communication Tool". Click "Connect" on the software interface. After success, you can enter APDU for operation.

When an error occurs when sending APDU to the card, please confirm that the card supports the APDU you sent.

The returned information status is as follows (SW1/SW2):

Result	SW1	SW2	Error Comment
Success	90	00	Successful operation
Error	63	00	operation failed
Error	6A	81	Function not supported

5.2 Get Data

This command will retrieve the SNR or ATS of the present card.

APDU Format:

Command	CLA	INS	P1	P2	Le
GetData	FF	CA	00/01	00	00(full length)

Answer:

P1=0x00h, the response format is to get UID (UID + SW)

Response	Data				
Result	UID(LSB)	--	UID(MSB)	SW1	SW2

P1 = 0x01h, the response format is to obtain the ATS of ISO14443 A card (ATS + SW)

Response	Data		
Result	ATS	SW1	SW2

Example:

Data block read and write operations of MIFARE Ultralight C card:

Send: FF CA 00 00 00 (finding card)

Receive: 04 0E 8B 8A 7C 3B 80 90 00

Send: FF 00 FF FF 08 01 00 A2 0401 02 03 04 (write block 04)

Receive: 90 00

Send: FF 00 FF FF 04 00 05 30 04 (read the 4 blocks starting from block 04)

Receive: 01 02 03 04 00 00 00 00 00 00 00 00 00 00 00 00 90 00

5.3 ISO14443-4 CPU Card Command

For the standard APDU of the card, simply send the APDU directly to the card reader to complete the card operation.

Example:

Get random number

Send: 00 84 00 00 08

Receive: 02 57 BB 9F 51 C6 6E 89 90 00

5.4 Direct RF Transaction

Send data stream over RF interface to card and receive the data.

APDU format

Command	CLA	INS	P1	P2	Lc	CMD	TMO	Data
Transaction	FF	00	FF	FF	2+n	CMD	FWI	Packet n

Lc: 1 byte, the number of bytes to be sent, the maximum value is 255.

CMD: 0: Send commands and receive data.

1: Send only.

TMO: Timeout parameter. Operate the M1 card, FWI = 4. When CMD=1, this byte is meaningless

Data: the data will send over RF interface

Answer:

Response	Data Out
Result	response data

5.5 MIFARE Classic/UltraLight/ISO15693 memory card command (T=CL simulation)

The APDU for MIFARE Classic/UltraLight/ISO15693 memory card operation in this part is sent by the PC to the reader/writer. The reader/writer performs analysis and processing according to the card's commands, which is different from the APDU of the CPU card.

5.5.1 Load Keys（LOAD AUTHENTICATION KEYS）

LOAD AUTHENTICATION KEYS is used to load authentication keys and communication encryption keys to the reader. The card authentication key is used to authenticate specific sectors of the MIFARE 1K/4K memory card. The communication encryption key is used to decrypt the ciphertext in the command. The downloaded key can be saved as non-volatile.

APDU Format:

Command	CLA	INS	P1	P2	Lc	Data
Load Keys	FF	82	Key Structure	Key Index	Key length	KeyData

Key Structure: 1byte

b7	b6	b5	b4	b3	b2	b1	b0	Description
X								0: Card Key; 1 Reader Key
	X							0: Plain Transmission, 1: Secured Transmission
		X						0: Keys are loaded into volatile memory 1: Keys are loaded into non-volatile memory.
			0	0	0	0	0	RFU

The non-volatile Key, which is stored in the Flash of the Reader, has write cycle limitation. Users need pay more attention to it.

Key Index:1byte

When the key structure b7=0: the value range is 00~1Fh, the card reader can store 32 card keys.

When the key structure b7=1: value range 00h, the card reader can store 1 card reader key.

Key Length:1byte

When loading the Reader Key, the length of the Key must be 16bytes, or the Reader will return fail.

When loading the Card Key by way of plaintext, the Reader no any restriction for the Key length.

When loading the Card Key by way of ciphertext, the Key length must be 8bytes or 16bytes.

Key:N byte

Load the reader/card key value of the reader.

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.2 Authentication

The AUTHENTICATION command uses the key stored in the reader to authenticate the MIFARE 1K/4K card. Two authentication keys will be used: KEY A and KEY B.

APDU Format:

Command	CLA	INS	P1	P2	Lc	Data

Authentication	FF	86	00	00	05	Data

Data:

Byte1	Byte2	Byte3	Byte4	Byte5
Version (0x01)	00	Address	KeyType	Key Index

Address: 1 Byte. This is the memory block number to be authenticated.

Key Type: 1 Byte

0x60 = Key is used as a KEY_A key for authentication.

0x61 = Key is used as a KEY_B key for authentication.

Key Index: 1 Byte

Key Index. The value range is 00h ~ 01Fh.

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.3 ReadBinaryBlocks

The READ BINARY BLOCKS command is used to retrieve multiple data blocks from the storage IC card. If the card is key protected, the data block must be key verified before executing this command.

APDU Format:

Command	CLA	INS	P1	P2	Le
Read Blocks	FF	B0	00	Address	Len

Address: 1Byte.The block to be accessed

Len: 1Byte. The number of bytes to be read (an integer multiple of 16 bytes, must be in the same block).

Answer:

Response	Data Out		
Result	Data	SW1	SW2

5.5.4 UpdateBinaryBlocks

The UPDATE BINARY BLOCKS command is used to write multiple "data blocks" to Classic/UltraLight. The data block/tail block must be verified before executing this command.

APDU Format:

Command	CLA	INS	P1	P2	Lc	Data
Update Blocks	FF	D6	00	Address	Len	Data

Address: 1Byte.The starting block to be updated.

Len: 1 byte, the number of bytes to be updated.

16*n(n>0) bytes for MIFARE 1K/4K.

4*n(n>0) bytes for MIFARE Ultra light.

Block Data: The data will be written into the binary block/blocks.

Answer:

Response	Data Out		
Result	Data	SW1	SW2

5.5.5 ValueBlockOperation

The VALUE BLOCK OPERATION command is used to perform numerical operations on Classic cards, such as increasing the value of a value block, etc.

APDU Format:

Command	CLA	INS	P1	P2	Lc	Data
Value Operation	FF	D7	00	Address	05	Data

Address: 1 byte, the block address to be operated on.

Data: VB_OP(1Byte) + VB_Value(4Bytes, LSB...MSB, signed long integer).

VB_OP:

00h = turns the block into a value block and initializes it to VB_Value.

01h = Increase the value of the value block by VB_Value. This command only works on value blocks.

02h = Decrement the value block by VB_Value. This command only works on value blocks.

VB_Value: The value used for value manipulation. The value is a signed long integer with LSB first.

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.6 ReadValueBlock

The READ VALUE BLOCK command is used to obtain the value in the value block from the Classic card, and is only applicable to operations on value blocks.

APDU Format:

Command	CLA	INS	P1	P2	Lc
ReadValueBlock	FF	B1	00	Address	04

Address:1 Byte,the value block to be accessed.

Answer:

Response	Data Out		
Result	Value	SW1	SW2

Value: 4 bytes (LSB...MSB). The block value read is a signed long integer.

5.5.7 RestoreValueBlock

The RESTORE VALUE BLOCK command is used to copy the values in one value block to another value block to the Classic card.

APDU Format:

Command	CLA	INS	P1	P2	Lc	Data	
Restore	FF	D7	00	SourceAdd	02	03	TargetAdd

Source Add: 1 byte, source value block address.

Target Add: 1 byte, target value block address, the source value block and the destination value block must be located in the same sector.

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.8 ISO15693 Write AFI

Write ISO15693 Tag AFI

APDU Format:

Command	**Class**	**INS**	**P1**	**P2**	**Lc**	**Data**
Write AFI	FF	00	40	06	01	AFI

AFI: AFI to write

Answer:

Response	**Data Out**	
Result	SW1	SW2

5.5.9 ISO15693 LockAFI

Lock ISO15693 Tag AFI

APDU Format:

Command	**Class**	**INS**	**P1**	**P2**	**Lc**
LockAFI	FF	00	40	07	00

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.10ISO15693 WriteDSFID

Write ISO15693 Tag DSFID

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
WriteDSFID	FF	00	40	08	01	DSFID

DSFID: DSFID to write

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.11ISO15693 LockDSFID

Lock ISO15693 Tag DSFID

APDU Format:

Command	Class	INS	P1	P2	Lc
LockDSFID	FF	00	40	09	00

Answer:

Response	Data Out	
Result	SW1	SW2

5.5.12ISO15693 GetSystemInformation

Get system information

APDU Format:

Command	Class	INS	P1	P2	Lc
GetSysInfomation	FF	00	40	0A	00

Answer:

Response	Data Out		
Result	System Information	SW1	SW2

SystemInfo：InfoFlag（1Byte）+UID（8Byte）+DSFID（1Byte）+AFI（1Byte）+Other（nByte）。

5.5.13ISO15693 Get Blocks Security

Get ISO15693 Tag block security status

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
GetBlkSec	FF	00	40	0B	02	Data

Data： StartAddr(1Byte) + Num(1Byte)

StartAddr： Starting block address

Num： Number of blocks (n+1, when n=0, only the security status of the starting block is read).

Answer:

Response	Data Out		
Result	BlockSecSta*Num	SW1	SW2

5.5.14ISO15693 Lock Block

Lock block

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
LockDSFID	FF	00	40	0C	01	Data

Data： BlockNO(1Byte)

BlockNO： Block number to be locked.

Answer:

Response	Data Out	
Result	SW1	SW2

5.6 Contactless Smart Card Operation Loop

5.6.1 ISO14443-4Card Operation

Basic Operation Loop:

Step 1 Put the CPU card into ContactlessReader antenna field

Step 2 Connect Contactless Reader

Step 3 Send APDU command

Example:

Get 8bytes Random

Send: 00 84 00 00 08

Receive: 1A F7 F3 1B CD 2B A9 58 90 00

5.6.2 MIFARE 1K/4KCard Operation

Basic Operation Loop:

Step 1 Put theMIFARE 1K/4K card into Contactless Reader antenna field

Step 2 Connect Contactless Reader

Step 3 SendMIFARE 1K/4K card operation commands

Example:

//Get Data

Send: FF CA 00 00 00

Receive: 03 12 94 DD 90 00

//Load reader key

Send: FF 82 A0 00 10 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF

Receive: 90 00

//Loading Card Key, Number 00h

Send: FF 82 00 00 06 FF FF FF FF FF FF

Receive: 90 00

//Ciphertext Load Card Key, Number 01h, The key plaintext is { FF FF FF FF FF FF **}**

Send: FF 82 60 01 08 C0 D6 1E B0 84 F9 43 57

Receive: 90 00

//Verify block 4

Send: FF 86 00 00 05 01 00 04 60 00

Receive: 90 00

//Write Data Into 04 Block

Send: FF D6 00 04 10 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 00

Receive: 90 00

//Read Data From 04/05 Block

Send: FF B0 00 04 20

Receive: 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF 90 00

//Purse Initialization（00000000h）

Send: FF D7 00 04 05 00 00000000

Receive: 90 00

//Read value block

Send: FF B1 00 04 04

Receive: 00 00 00 00 90 00

//Purse Increment（02000000h）

Send: FF D7 00 04 05 01 00 00 00 02

Receive: 90 00

//Read value block

Send: FF B1 00 04 04

Receive: 00 00 00 02 90 00

//Purse Decrement（01000000h）

Send: FF D7 00 04 05 02 00 00 00 01

Receive: 90 00

//Read value block

Send: FF B1 00 04 04

Receive: 00 00 00 01 90 00

//Purse Copy

Send: FF D7 00 04 02 03 05

Receive: 90 00

//Read Purse Value

Send: FF B1 00 05 04

Receive: 00 00 00 01 90 00

5.6.3 MIFARE Ultra Light Card Operation

Basic Operation Loop:

Step 1 Put the MIFARE UltraLight card into Contactless Reader antenna field

Step 2 Connect Contactless Reader

Step 3 Send MIFARE Ultra Light card operation commands

Example:

//Get Data

Send: FF CA 00 00 00

Receive: 04 0E 8B 8A 7C 3B 80 90 00

//Read data from blocks 4~7

Send: FF B0 00 04 10

Receive: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 90 00

//Write data into block 4

Send: FF D6 00 04 04 00 01 02 03

Receive: 90 00

//Write data into blocks 5~7

Send: FF D6 00 05 0C 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

Receive: 90 00

//Read data from blocks 4~12

Send: 0xFF B0 00 04 20

Receive: 0x00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 90 00

5.6.4 ISO15693 Tags Operation

Basic Operation Loop:

Step 1 Put the Tag into Contactless Reader antenna field

Step 2 Connect Contactless Reader

Step 3 Send ISO15693 Tag operation commands

Example:

//Get Data

Send: FF CA 00 00 00

Receive: 00 AC 9C FC A3 00 01 04 E0 90 00

//Read block 8 ~ 11

Send: FF B0 00 08 10

Receive: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF 90 00

//write blocks 8 ~ 11

Send: FF D6 00 08 10 12 34 56 78 87 65 43 21 11 22 33 44 55 66 77 88

Receive: 90 00

//read blocks 8 ~ 11

Send: FF B0 00 08 10

Receive: 12 34 56 78 87 65 43 21 11 22 33 44 55 66 77 88 90 00

//write AFI = 0x12

Send: FF 00 40 06 01 12

Receive: 90 00

//lock AFI

Send: FF 00 40 07 00

Receive: 90 00

//write AFI = 0x34

Send: FF 00 40 06 01 34

Receive: 63 00 (AFI locked, write failed)

//write DSFID = 0x34

Send: FF 00 40 08 01 34

Receive: 90 00

//lock DSFID

Send:	FF 00 40 09 00
Receive:	90 00
	//write DSFID = 0x56
Send:	FF 00 40 08 01 56
Receive:	63 00 (DSFID locked, write failed)
	//Get System Information
Send:	FF 00 40 0A 00
Receive:	0F AC 9C FC A3 00 01 04 E0 34 12 1B 03 01 90 00
	//block lock test
	//write block 0x19
Send:	FF D6 00 19 04 19 19 19 19
Receive:	90 00
	//read block 0x19
Send:	FF B0 00 19 04
Receive:	19 19 19 19 90 00
	//lock block 0x19
Send:	FF 00 40 0C 01 19
Receive:	90 00
	//read security of blocks 0x00 ~ 0x19
Send:	FF 00 40 0B 02 00 19
Receive:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 90 00
	//write block 0x19 块
Send:	FF D6 00 19 04 FF FF FF FF
Receive:	63 00 (block locked, write failed)

6 SAM Readers Commands

IMPORTANT: SAM(s) need to install before the reader power up. After connect to SAM readers, users could send APDU to SAM directly.

7 Contact Smart Card Reader Commands

After inserting the Contact SmartCard into the contact card slot, and then connecting the reader, you can directly send APDU commands to the Contact SmartCard.

Support hot-swappable function.

8 Device Controller Commands

The APDUs in this section are all operations for the reader/writer (i.e. the "device" channel). Users only need to successfully connect the DEVICE to send the following APDUs.

8.1 Reset SAM Card

Reset SAM card manually.

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
RstCard	FF	00	60	10	03	Parameter

Parameter: SAMNO(1Byte) + **BaudRate**(1Byte) + **PPSPa**(1Byte)

SAMNO:

0x00 - Contact CPU card

0x01 - SAMCard

BaudRate: Reset Baud Rate

0x00 - 9600

0x01 - 19200

0x02 - 38400

0x03 - 55800

0x04 - 57600

0x05 - 115200

0x06 - 230400

PPSPa: Communication Baud Rate

0x00 - 9600

0x01 - 19200

0x02 - 38400

0x03 - 55800

0x04 - 57600

0x05 - 115200

0x06 - 230400

0xFE - set PPS according to ATR information

0xFF - disable PSS operation

Answer:

Response	Data Out		
Result	ATR	SW1	SW2

8.2 Set SAM Reset Parameters while Power up

All SAM cards will be reset while reader power up. This function is set the SAM reset parameters while power up. The default baud rate is 9600bps and the default PPS is Disable. This parameter is saved when power lost.

APDU Format:

Command	Class	INS	P1	P2	Lc	Data		
SetRstSamBaud	FF	00	60	11	03	SAMn	Baudrate	PPSPa

SAMn:

0x00 - Contact CPU card

0x01 - SAMCard

Baudrate:

0x00 - 9600

0x01 - 19200

0x02 - 38400

0x03 - 55800

0x04 - 57600

0x05 - 115200

0x06 – 230400

PPSPa: PPS Baud Rate

0x00 - 9600

0x01 - 19200

0x02 - 38400

0x03 - 55800

0x04 - 57600

0x05 - 115200

0x06 - 230400

0xFE - set PPS according to ATR information

0xFF - disable PSS operation

Answer:

Response	Data Out	
Result	SW1	SW2

8.3 Read reset parameters of SAM Card

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
ReadRstBaud	FF	00	60	12	01	SAMn

SAMn:

0x00 - Contact CPU card

0x01 - SAMCard

Answer:

Response	**Data Out**			
Result	RstBaud	PPSPa	SW1	SW2

RstBaud:

0x00 - 9600

0x01 - 19200

0x02 - 38400

0x03 - 55800

0x04 - 57600

0x05 - 115200

0x06 – 230400

PPSPa:

0x00 - 9600

0x01 - 19200

0x02 - 38400

0x03 - 55800

0x04 - 57600

0x05 - 115200

0x06 - 230400

0xFE - set PPS according to ATR information

0xFF - disable PSS operation

8.4 Set Card Operation Mode

Some ISO14443-4 card combined with a MIFARE 1 card. The SAK will indicate it is a ISO14443-4 card. This command is use for set the reader to operate the card by method of MIFARE 1.

APDU Format:

Command	CLA	INS	P1	P2	Lc	Data
Set Mode	FF	00	FF	10	01	Status

Status:

0x00: Operate the card use ISO14443-4 method

0x01: Operate the card use MIFARE 1 method

Note: Each time you switch modes, you need to re-insert the card and reconnect the smart card.

Answer:

Response	Data Out	
Result	SW1	SW2

Example:

Send: FF 00 FF 10 01 01

Receive: 90 00

8.5 Get Device SNR

APDU Format:

Command	Class	INS	P1	P2	Le
GetSNR	FF	00	FF	00	0A

Answer:

Response	Data Out		
Result	Product SNR	SW1	SW2

Example:

Send: FF 00 FF 00 0A

Receive: 01 05 07 09 09 04 03 08 06 09 90 00

8.6 Get Hardware and Firmware Version

Products that do not support DEVICE device drivers can be used with SAM Reader and Contactless Reader device drivers.

APDU Format:

Command	Class	INS	P1	P2	Le
GetVer	FF	00	FF	01	04

Answer:

Response	Data Out		
Result	HandwareVer(2Byte)+ Software Ver(2Byte)	SW1	SW2

Example:

Send: FF 00 FF 01 04

Receive: 01 00 01 05 90 00

8.7 Set Buzzer

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
BuzzerCtr	FF	00	FF	03	05	Data

Data: BeepStatus + **BeepStatusMask** + **T1Duration** + **T2Duration** + **Number**

BeepStatus:

BIT0 = BEEP final state (1 - ON, 0 - OFF)

BIT4 = BEEP initial state (1 - ON, 0 - OFF)

StatusMask:

BIT0 = Buzzer status update mask (1 - Update, 0 - Maintenance)

BIT1~7 RFU

T1/T2: T1, T2 time (Unit: 100ms), T = T1+T2

Number: Times

Answer:

Response	Data Out	
Result	SW1	SW2

Example:

Buzzer beeps two times

Send: FF 00 FF 03 05 08 01 0F 0F 02

Receive: 90 00

8.8 Set Card Encryption Mode

Set MIFARE 1K card authentication encryption standard

APDU Format:

Command	Class	INS	P1	P2	Lc	Data
EncrMode	FF	00	FF	05	01	EncryptMode

EncryptMode:

0x00-Philips

0x01-Shanghai Standard

Answer:

Response	Data Out	
Result	SW1	SW2

Example:

Set Shanghai Encryption Mode

Send: FF 00 FF 05 01 01

Receive: 90 00

8.9 Reader Reset to Factory Default (Repower on)

Products that do not support DEVICE device drivers can be used with SAM Reader and Contactless Reader device drivers.

APDU Format:

Command	Class	INS	P1	P2	Le
FactoryDefault	FF	00	FF	06	00

Answer:

Response	Data Out	
Result	SW1	SW2

Example:

Send: FF 00 FF 06 00

Receive: 90 00

8.10 Reader Reboot

APDU Format:

Command	Class	INS	P1	P2	Le
Reboot	FF	00	FF	07	00

Answer:

Response	Data Out	
Result	SW1	SW2

Example:

Send: FF 00 FF 07 00

Receive: 90 00

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