CRT Card Communication Protocol

Content

1. Mifare 1 Card Operation Command

1.1 Seek RF card:

Host sends:

0x02	0x00	0x02	0x35	0x30	0x03	BCC

Reader returns:

0x02	0x00	0x03	0x35	0x30	P	0x03	BCC

P= 'Y' (0X59) seek card successfully

P= 'N' (0X4E) fail to seek card

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

1.2 Capture S/N of Mifare 1 card

Host sends:

0x02	0x00	0x02	0x35	0x31	0x03	BCC

Reader returns:

0x02	0x00	0x06	0x35	0x31	Operation status P	4 byte hex Card S/N	0x03	BCC

P= 'Y' (0X59) capture card S/N successfully and return the card S/N;

P= 'N' (0X4E) fail to capture card S/N and return empty S/N (0X00, 0X00, 0X00, 0X00)

P= 'E' (0X45) no card in

4 byte Card S/N transmitted by hex, such as "C6B272AE"

E.g.: The uploading communication package: 0x02 0x00 0x06 0x35 0x31 0xC6 0xB2 0x72 0xAE 0x03 BCC

1.3 Check Password of Sector

Use Key_A or Key_B to check the appointed sector

1.3.1. Parity Key_A:

Host sends:

0x02	0x00	0x09	0x35	0x32	Sector No.	6 byte hex Password	0x03	BCC

Sector No.= 0x00 0x1 0x02 ……0x0F

Reader returns:

0x02	0x00	0x03	0x35	0x32	Sector No.	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) password parity successfully

P= '0' (0X30) fail to seek RF card

P= '3' (0X33) password error

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

1.3.2. Parity Key_B

Host sends:

0x02	0x00	0x09	0x35	0x39	Sector No.	6 byte hex Password	0x03	BCC

Sector No.= 0x00 0x1 0x02 ……0x0F

Reader returns:

0x02	0x00	0x03	0x35	0x39	Sector No.	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) password parity successfully

P= '0' (0X30) no RF card in

P= '3' (0X33) password error

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

1.4 Read data on sector

Host sends:

0x02	0x00	0x04	0x35	0x33	Sector No.	Block No.	0x03	BCC

Sector No.= 0x00 0x1 0x02 ……0x0F

Block No.= 0x00 0x01 0x02 0x03

Reader reads data successfully and returns:

0x02	0x00	0x15	0x35	0x33	Sector No.	Block No.	P=0x59	16 byte hex Data	0x03	BCC

Operation status byte: P= 'Y' (0X59)

Read sector block data successfully and upload 16 byte data

Reader fails to read sector block data and returns:

0x02	0x00	0x05	0x35	0x33	Sector No.	Block No.	Operation status byte P	0x03	BCC

Operation status byte

P= '0' (0X30) cannot seek RF card

P= '1' (0X31) operated sector No. is wrong (not the sector by password checked)

P= '2' (0X32) S/N of operated card error

P= '3' (0X33) password error

P= '4' (0X34) data read error

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

1.5 Write data on sector

Host sends:

0x02	0x00	0x14	0x35	0x34	Sector No.	Block No.	16 byte hex Data	0x03	BCC

Sector No.= 0x00 0x1 0x02 ……0x0F

Block No.＝0x00 0x01 0x02 0x03

Reader writes data successfully and returns:

0x02	0x00	0x15	0x35	0x34	Sector No.	Block No.	P	16 byte hex Data	0x03	BCC

Operation status byte: P= ‘Y’ (0X59)

Write sector block data successfully and upload 16 byte data that is written

Reader fails to write sector block data and returns:

0x02	0x00	0x05	0x35	0x33	Sector No.	Block No.	Operation status byte P	0x03	BCC

Operation status byte

P= ‘0’ (0X30) cannot seek RF card

P= ‘1’ (0X31) operated sector No. is wrong (not the sector by password checked)

P= ‘2’ (0X32) S/N of operated card error

P= ‘3’ (0X33) password error

P= ‘4’ (0X34) block data written error

P= ‘E’ (0X45) no card in

P=‘w’ (0X57) card is not at the permitted operation position

Note: The third block of each sector is KEYA, storage area, KEYB, and write on this block may lead card locked and useless, please be cautious when operate to this block. To find detail in Philip M1 card specification.

1.6 Modify password

This operation can modify password of KEYA only, and change KEYB password to: “0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF”; at the same time modify the storage area to: “0xFF, 0x07, 0x80, 0x69”. (Default when ex-work)

Host sends:

0x02	0x00	0x09	0x35	0x35	Sector No.	6 byte hex Password	0x03	BCC

Sector No.= 0x00 0x1 0x02 ……0x0F

Reader returns:

0x02	0x00	0x04	0x35	0x35	Sector No.	Operation status byte P	0x03	BCC

Operation status byte

P= ‘Y’ (0X59) password changed successfully

P= ‘0’ (0X30) cannot seek RF card

P= ‘1’ (0X31) operated sector No. is wrong (not the sector by password checked)

P= ‘2’ (0X32) S/N of operated card error

P= ‘3’ (0X33) password error

P= ‘E’ (0X45) no card in

P=‘w’ (0X57) card is not at the permitted operation position

To change operation password of sector (KeyA or KeyB) and the storage area completely, write block 3 data of each sector after checking password successfully.

The format as below (see details in PHILIPS M1 card specification):

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
6 byte KeyA password						4 byte storage area				6 byte KeyB password					

1.7 Increment Operation

Host sends:

0x02	0x00	0x08	0x35	0x37	Sector No.	Block No.	4 byte hex data	0x03	BCC

Sector No.= 0x00 0x1 0x02 ……0x0F

Block No.＝0x00 0x01 0x02 0x03

4 byte hex data is the increased value of appointed sector block (low byte in front, high byte behind).

The value cannot be 0; otherwise, operating will be failure.

Eg. The sector 5 block 0 need to increase to 0x10, the 4 byte hex data are: "0x10, 0x00, 0x00, 0x00"

Reader returns:

0x02	0x00	0x05	0x35	0x37	Sector No.	Block No.	Operation status byte P	0x03	BCC

Operation status byte

P= '0 '(0X30)	cannot seek RF card
P= '1' (0X31)	operated sector No. is wrong (not the sector by password checked)
P= '2' (0X32)	S/N of operated card error
P= '3' (0X33)	password error
P= '4' (0X34)	format of block data error (not written in a value format)
P= '5' (0X35)	increment over load
P= 'E' (0X45)	no card inside
P= 'Y' (0X59)	operation successful
P='w' (0X57)	card is not at the permitted operation position

1.8 Decrement operation

Host sends:

0x02	0x00	0x08	0x35	0x38	Sector No.	Block No.	4 byte hex data	0x03	BCC

Sector No. = 0x00 0x1 0x02 ……0x0F

Block No.＝0x00 0x01 0x02 0x03

4 byte hex data is the decreased value of appointed sector block (low byte in front, high byte behind).

The value cannot be 0; otherwise, operating will be failure.

Reader returns:

0x02	0x00	0x05	0x35	0x38	Sector No.	Block No.	Operation status byte P	0x03	BCC

Operation status byte

P= ‘0’ (0X30) cannot seek RF card

P= ‘1’ (0X31) operated sector No. is wrong (not the sector by password checked)

P= ‘2’ (0X32) S/N of operated card error

P= ‘3’ (0X33) password error

P= ‘4’ (0X34) format of block data error (not written in a value format)

P= ‘5’ (0X35) decrement over load

P= ‘E’ (0X45) no card inside

P= ‘Y’ (0X59) operation success

P=‘w’ (0X57) card is not at the permitted operation position

1.9 Value initialize

Executed by write block data command, write 16 byte data according to MIFARE value format. The format as below:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Value				/Value				Value				Adr	/Adr	Adr	/Adr

Value: the initializing 4 byte value, low byte of the value in front, high byte behind

/Value: value opposite the initializing 4 byte value

Adr: the block address of the initializing value: Adr= sector No. X 4 + block No.

/Adr: value opposite of the initializing block address

Eg. The sector 5 block 0 initial value is 10, the 16 byte data write to sector block are:

“0x0A, 0x00, 0x00, 0x00, 0xF5, 0xFF,0xFF ,0xFF , 0x0A, 0x00, 0x00, 0x00, 0x14,0xEB, 0x14, 0xEB ”

1.10 Read value

Executed by read sector block data command, for the16 byte data format, it should be in MIFARE card value data format. If yes, read the value, if not, reading error alert (error data format).

NOTE: when processing a value operation, block 3 of each sector cannot save a value data. And notice the address range of the sector when initializing value, increment, decrement, read value.

2. 24CXX Series Card Operation (24C01、24C02、24C04、24C08、24C16、24C32、24C64)

2.1 Card type setting

Host sends:

0x02	0x00	0x03	0x36	0X30	Card type N	0x03	BCC

N=0x30 Set card as 24C01 128BYTE ADR=0x0000—0x007F

N=0x31 Set card as 24C02 256BYTE ADR=0x0000—0x00FF

N=0x32 Set card as 24C04 512BYTE ADR=0x0000—0x01FF

N=0x33 Set card as 24C08 1K BYTE ADR=0x0000—0x03FF

N=0x34 Set card as 24C16 2K BYTE ADR=0x0000—0x07FF

N=0x35 Set card as 24C32 4K BYTE ADR=0x0000—0x0FFF

N=0x36 Set card as 24C64 8K BYTE ADR=0x0000—0x1FFF

Reader returns:

0x02	0x00	0x04	0x36	0X30	Card type N	Operation status byte P	0x03	BCC

P= 'N' (0X4E) set card unsuccessfully

P= 'Y' (0X59) set card successfully

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

2.2 Read card

Host sends:

0x02	0x00	0x06	0x36	0x31	Card type N	Operation first address 2 byte	Operation length: L	0x03	BCC

Operation length L=0X01~0X80: 1 BYTE ≤ L ≤ 128 BYTE

Operation first address 2 BYTE: effective address depended on capacity of card.

Reader returns:

Read card successfully and return: P= 'Y' (0X59)

0x02	Communication package Length (2 byte)	0x36	0x31	Card type N	Operation status byte P	Operation first address 2 byte	Operation length L	Data read n byte	0x 03	BCC

Communication Package Length= 7 + operation length L

Fail to read card and return:

Fail to read card and return:

0x02	0x00	0x04	0x36	0x31	Card type N	Operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to read card

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

2.3 Write card

2.3.1 Write without parity

Host sends:

0x02	Communication package Length (2 byte)	0x36	0x32	Card type N	Operation first address 2 byte	Operation length L	Data read n byte	0x03	BCC

Note: Communication Package Length= 6 + operation length L

Operation length L=0X01~0X80: 1 byte ≤ L ≤ 128 byte

Reader returns:

0x02	0x00	0x04	0x36	0x32	Card type N	Operation status byte P	0x03	BCC

P= 'Y' (0X59) write card successfully

P= 'N' (0X4E) fail to write card

P= 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

2.3.2 Write with parity

Host sends:

0x02	Communication package Length (2 byte)	0x36	0x33	Card type N	Operation first address 2 byte	Operation length L	Data read n byte	0x03	BCC

Note: Communication Package Length= 6 + operation length L

Operation length L=0X01~0X80: 1 byte ≤ L ≤ 128 byte

Reader returns:

Write card successfully with parity and return:

0x02	Communication package Length (2 byte)	0x36	0x33	Card type N	Operation first address 2 byte	Operation length L	Read data written n byte	0x03	BCC	0x02

Communication Package Length= 7 + operation length L

Fail to write card and return:

Reader returns:

0x02	0x00	0x04	0x36	0x33	Card type N	Operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to write card

P = 'E' (0X45) no card in

P='w' (0X57) card is not at the permitted operation position

3. Contact CPU Card Operation

3.1 Reset CPU card

Host sends:

0x02	0x00	0x02	0x37	0X30	0x03	BCC

Reader operates successfully and returns: T=0 CPU card reset successfully and return operation status byte P= 'Y' (0X59)

0x02	Communication package length 2 byte	0x37	0x30	operation status byte P	Length of reset data package 2 byte	Data reset n byte	0x03	BCC

Communication package length=5+ length of data reset n

Reader operates successfully and returns: T=1 CPU card reset successfully and return operation status byte P= 'Z' (0X5A)

0x02	Communication package length 2 byte	0x37	0x30	operation status byte P	Length of reset data package 2 byte	Data reset n byte	0x03	BCC

Communication package length=5+ reset length of data reset n

Reader fails to operate and returns:

0X02	0X00	0X03	0X37	0X30	Operation status p	0X03	BCC

P= 'N' (0X4E) fail to reset

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

3.2 CPU card C-APDU operation: (T=0 CPU operation)

0x02	Communication package length 2 byte	0x37	0x31	C-APDU package length 2 byte	C-APDU package n byte	0x03	BCC

Communication package length=4+ C-APDU package length n (n= 262 byte max)

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	Communication package length 2 byte	0x37	0x31	operation status byte P	C-APDU operation return package length 2 byte	C-APDU Operation return package n byte	0x03	BCC

Communication package length=5+ C-APDU return package length n (n=257byte max)

Reader fails to operate and returns:

0x02	0x00	0x03	0x37	0x32	Operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to reset

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

3.3 CPU card C-APDU operation: (T=1 CPU operation)

0x02	Communication package length 2 byte	0x37	0x32	C-APDU package length 2 byte	C-APDU package n byte	0x03	BCC

Communication package length=4+ C-APDU package length n (n= 262 byte max)

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	Communication package length 2 byte	0x37	0x32	operation status byte P	C-APDU operation return package length 2 byte	C-APDU Operation return package n byte	0x03	BCC

Communication package length=5+ C-APDU return package length n (n=257byte max)

Reader fails to operate and returns:

0x02	0x00	0x03	0x37	0x31	Operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to reset

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

For the operation of CPU card C-APDU, please select the correspond command of T=0/T=1 according to CPU reset card type.

4. SIMENS SLE4442 Card Operation

4.1 SLE4442 card reset

Host sends:

0x02	0x00	0x02	0x38	0X30	0x03	BCC

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	0x00	0x07	0x38	0x30	operation status byte P	Reset data package 4 byte	0x03	BCC

Reader fails to operate and returns:

0x02	0x00	0x03	0x38	0x30	operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to reset

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

4.2 Read 4442 main memory

Host sends:

0x02	0x00	0x04	0x38	0X31	Read first address ADR 1 byte	Read length L 1 byte	0x03	BCC

ADR= 00-FF

L = 0x01-0x80

Operation length L=0X01-0X80, 1 byte ≤ L ≤ 128 byte

Main memory of 4442 has 256 bytes; please be cautious about operation address and length within valid range.

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	Communication length 2 byte	0x38	0x31	operation status byte P	Read first address ADR	Read length L	Read data L byte	0x03	BCC

Communication length=5+ read length L

Reader fails to operate and returns

0x02	0x00	0x05	0x38	0x31	operation status byte P	Read first address ADR	Read length L	0x03	BCC

P= 'N' (0X4E) fail to read card

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

4.3 Read 4442 protection area

Host sends:

0x02	0x00	0x02	0x38	0x32	0x03	BCC

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	0x00	0x23	0x38	0x32	operation status byte P	32 byte protection bit	0x03	BCC

Each bit in Protection Memory is corresponding with the protection status of the same address in Main Memory. The address ranks from low to high.

Protection bit=0x00 Protect bit valid, can not write this byte

Protection bit=0x01 Protect bit invalid, can write the data of this byte

Reader fails to operate and returns:

0x02	0x00	0x03	0x38	0x32	operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to read card

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

4.4 Read 4442 PSC area

Host sends:

0x02	0x00	0x02	0x38	0x33	0x03	BCC

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	0x00	0x07	0x38	0x33	operation status byte P	Security area data package 4 byte	0x03	BCC

First byte in Security Area data package: password error counter

Second byte in Security Area data package: password data 1

Third byte in Security Area data package: password data 2

Fourth byte in Security Area data package: password data 3

Password error counter=0x07 (password error amount is 0), 0x03 (password error amount is 1), 0x01 (password error amount is 2), 0x00 (password error code is 1, card useless)

Reader fails to operate and returns:

0x02	0x00	0x03	0x38	0x33	operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to read

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

4.5 Password parity:

Host sends:

0x02	0x00	0x05	0x38	0x34	Password data, 3 byte	0x03	BCC

Reader operates and returns:

0x02	0x00	0x03	0x38	0x34	operation status byte P	0x03	BCC

P= 'Y' (0X59) Password correct

P= 'N' (0X4E) Password error

P= 'E' (0X45) No card in

P='W' (0X57) Card is not at the permitted operation position

4.6 Write main memory (00H-FFH)

Host sends:

0x02	Communication length 2 byte	0x38	0x35	Write first address ADR	Write length L	Write data L byte	0x03	BCC

Communication length = 4+ write length L

Operation length L = 0x01~0x80, 1 byte ≤ L ≤ 128 byte

Reader operates and returns:

0x02	0x00	0x05	0x38	0x35	operation status byte P	Write first address ADR	Write length L	0x03	BCC

P= 'Y' (0X59) write successfully

P= 'N' (0X4E) fail to write

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

4.7 Write protection memory (ADR: 0x00-0x1f, 32 BYTE with write protection function to proceed with first address, and appoint length to write protection)

Host sends:

0x02	Communication Package length L	0x38	0x36	Adr	len	Len byte write protection Status	0x03	BCC

Notes: Adr: first address byte of writing protection Adr: 0x00---0x1F

Len: length of byte of writing protection 0x00<len<0x1F

Sbyte : status byte package of unit of writing protection

0x01: write protection in a correspond unit

0x00: not write protection in a correspond unit

Communication package length L=4+len

Modify write protection memory: address range 00H-31H only. And once written the protection bit can not be erased. When it is in operation we should confirm the ranks of Adr and len, it can write protection for every unit byte

Reader operates and returns:

0x02	0x00	0x03	0x38	0x36	operation status byte P	0x03	BCC

P= 'Y' (0X59) write successfully

P= 'N' (0X4E) fail to write

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

E.g., Write protection of 0x10 0x11 0x12

Host sends

0x02	0x00	0x07	0x38	0x36	0x10	0x03	0x01	0x01	0x01	0x03	BCC

4.8 Modify password

Host sends:

0x02	0x00	0x05	0x38	0x37	Password data 3 byte	0x03	BCC

Reader operates and returns:

0x02	0x00	0x03	0x38	0x37	operation status byte P	0x03	BCC

P= 'Y' (0X59) password changed successfully

P= 'N' (0X4E) fail to change password

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5. SL4428 Card Operation

5.1 Reset

Host sends:

0x02	0x00	0x02	0x39	0X30	0x03	BCC

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	0x00	0x07	0x39	0x30	operation status byte P	Reset data package 4 byte	0x03	BCC

Reader fails to operate and returns:

0x02	0x00	0x03	0x39	0x30	operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to reset

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5.2 Read 4428 main memory (without protection bit)

Host sends:

0x02	0x00	0x05	0x39	0X31	Read first address ADR 2 byte	Read length L 1 byte	0x03	BCC

ADR=0000-03FF

L =0x01- 0x80

Operation length L=0X01~0X80, 1 byte ≤ L ≤ 128 byte

Main memory of 4428 has 1K byte; please cautious about operation address and length within valid range.

Reader operates successfully and returns: operation status byte P = 'Y' (0X59)

0x02	Communication length 2 byte	0x39	0x31	operation status byte P	Read first address 2 byte	Read length L 1bye	Read data L byte	0x03	BCC

Communication length=6+ read length L

Reader fails to operate and returns:

0x02	0x00	0x06	0x39	0x31	operation status byte P	Read first address 2 byte	Read length L 1 byte	0x03	BCC

P= 'N' (0X4E) fail to read

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5.3 Read 4428 protection bit

Host sends:

0x02	0x00	0x05	0x39	0X32	Read first address ADR 2 byte	Read length L 1 byte	0x03	BCC

ADR=0000-03FF

L =0x01- 0x80

Operation length L=0X01~0X80, 1 byte ≤ L ≤ 128 byte

Main memory of 44 has 1K byte; please cautious about operation address and length within valid range.

Each bit in Protection Memory is corresponding with the protection status of same address in Main Memory. The address ranks from low to high.

Protection bit=0x00 Protect bit valid, can not change the data of this byte

Protection bit=0x01 Protect bit invalid, can change the data of this byte

Reader operates successfully and returns: operation status byte P= 'Y' (0X59)

0x02	Communication length 2 byte	0x39	0x32	operation status byte P	Read first add 2 byte	Read length L 1 byte	Protection bit data L byte	0x03	BCC

Communication length=6+ read length L

Reader fails to operate and returns:

0x02	0x00	0x06	0x39	0x32	operation status byte P	Read first add 2 byte	Read length L 1 bye	0x03	BCC

P= 'N' (0X4E) fail to read

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5.4 Password parity

Host sends:

0x02	0x00	0x04	0x39	0x33	Password data 2 byte	0x03	BCC

Reader operates and returns

0x02	0x00	0x03	0x39	0x33	Operation status byte P	0x03	BCC

P= 'Y' (0X59) password correct

P= 'N' (0X4E) password error

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5.5 Write data (without protection bit)

Host sends:

0x02	Communication length 2 byte	0x39	0x34	write first add ADR 2byte	write length L 1 byte	write data L byte	0x03	BCC

Communication length = 5+ write length L

Range of address=0x0000—0x03FF;

Operation length L=0X01~0X80, 1 byte ≤ L ≤ 128 byte

Note: Last three byte (0x03FD, 0x03FE, 0x03FF) is the error counter of 4428 card; please do not operate these bytes for it is easy making card useless.

Reader returns:

0x02	0x00	0x06	0x39	0x34	Operation status byte P	Write first add ADR 2 byte	Write length L 1 byte	0x03	BCC

P= 'Y' (0X59) write successfully

P= 'N' (0X4E) fail to write

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5.6 Write data (with protection bit)

0x02	Communication length 2 byte	0x39	0x35	write first add ADR 2byte	write length L 1 byte	write data L byte	0x03	BCC

Communication length = 5+ write length L

Range of address=0x0000—0x03FF;

Operation length L=0X01~0X80, 1 byte ≤ L ≤ 128 byte

Note: Last three byte (0x03FD, 0x03FE, 0x03FF) is the error counter of 4428 card, password parity 1, password parity 2 please do not operate these bytes for it is easy making card useless. Meantime, it can't be modified once write protection bit.

Reader returns:

0x02	0x00	0x06	0x39	0x35	Operation status byte P	Write first add ADR 2 byte	Write length L 1 byte	0x03	BCC

P= 'Y' (0X59) write successfully

P= 'N' (0X4E) fail to write

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

5.7 Modify password

Host sends:

0x02	0x00	0x06	0x39	0x36	Original password data 2	New password data 2	0x03	BCC

					byte	byte		

Reader returns:

0x02	0x00	0x03	0x39	0x36	Operation status byte P	0x03	BCC

P= 'Y' (0X59) password changed successfully

P= 'N' (0X4E) fail to change password

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

6. AT88SC102 Operation

6.1 Reset:

Host sends:

0x02	0x00	0x02	0x3A	0x30	0x03	BCC

Reader returns:

0x02	0x00	0x03	0x3A	0x30	Operation status bit P	0x03	BCC

Operation status bit P= 'Y' (0X59) reset successfully

P= 'N' (0X4E) fail to reset

P= 'E' (0X45) no card in

P='W' (0X57) card is not at the permitted operation position

6.2 Main password modify

Main password (2 byte), erase password 1 (6 byte), erase password 2 (4 byte)

Host sends:

0x02	0x00	0x04	0x3A	0X31	Password data package 2 byte	0x03	BCC

Reader returns:

0x02	0x00	0x04	0x3A	0x31	Password code	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) password parity successful

P= 'N' (0X4E) password parity failure

P= 'E' (0X45) no card in reader

P= 'F' (0X46) card useless (after password parity failure overrun the permission times, card invalidate)

P='W' (0X57) card is not at the permitted operation position

Under safety grade 1 mode, all units can be read after the main password parity.

Under safety grade 2 mode, units except password memory unit, can be read after the main password parity.

6.3 Read memory zone (application zone 1, application zone 2, control zone)

Host sends:

0x02	0x00	0x05	0x3A	0x32	Zone code	Read application first address adr 1 byte	Read application length len 1 byte	0x03	BCC

Note: zone code=0x30 control zone (control zone= units except application zone 1, 2)

=0x31 application zone 1 (64 byte address range 0x16-0x55)

=0x32 application zone 2 (64 byte address range 0x5C-0x9B)

Reader operation successful returns: operation status byte P= 'Y' (0X59)

0 x 0 2	Communication length L 2 byte	0 x 3 A	0 x 3 2	Zone code	Operation status byte P	Read application first address adr 1 byte	Read application zone length len 1 byte	Read data Len byte	0 x 0 3	B C C

Communication length L=5+ read application zone length len

Reader operation failure returns:

0x02	0x00	0x06	0x3A	0x31	Zone code	Operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to read

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

6.4 Erase memory zone (prepare to write data)

6.4.1 Erase application zone under safety mode 1

Host sends:

0x02	0x00	0x05	0x3A	0x33	Zone code B	Erase memory zone head address adr 1 byte	Erase memory zone length len 1 byte	0x 03	BCC

Zone code

B= 0x30 erase control zone under safety mode 1

B= 0x31 erase application zone 1 under safety mode 1

B= 0x32 erase application zone 1 under safety mode 2

Reader returns:

0x02	0x00	0x05	0x3A	0x33	Zone code	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) successful

P= 'N' (0X4E) failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

6.4.2 Erase memory zone 1 under safety mode 2

Host sends:

0x02	0x00	0x09	0x3A	0x33	0x33	Erase password data package 6 byte	0x03	BCC

Reader returns:

0x02	0x00	0x05	0x3A	0x33	Zone code	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) successful

P= 'N' (0X4E) failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

6.4.3 Erase application zone 2 under safety mode 2

Host sends:

0x02	0x00	0x08	0x3A	0x33	0x34	EC2	Erase password data package 4 byte	0x03	BCC

Erase fuse status operation byte EC2 = 0x30 Erase unfused application zone 2

= 0x31 Erase fused application zone 2

Reader returns:

0x02	0x00	0x05	0x3A	0x33	Zone code	Operation status P	0x03	BCC

Operation status P= 'Y' (0X59) successful

P= 'N' (0X4E) failure

P= 'E' (0X45) no card in reader

P= 'F' (0X46) the zone 2 useless, can read only.

P='W' (0X57) card is not at the permitted operation position

(EC2 fuse unfused overrun the permission erase times (128 times) can not erase data any longer)

6.4.4 Write memory zone (application zone 1, application zone 2, control zone)

Host sends:

0x02	Communication length L 2 byte	0x3A	0x34	Zone code	Write memory zone address adr 1 byte	Write memory zone length len1 byte	Write data length Len byte	0x03	BCC

Communication length L=5+ Write data length len

Reader returns:

0x02	0x00	0x06	0x3A	0x34	Zone code	Operation status P	0x03	BCC

P= 'Y' (0X59) write card successful

P= 'N' (0X4E) write card failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

Under safety mode 1, all units can erase and write as long as main password checked. To prevent modifying password memory unit and result in card useless, some data cannot write in control zone unit liberty.

Under safety mode 2, can only erase and write application zone units after main password checked, all control zone units cannot be erased and written. Application zone can be written only after main password checked and erase password checked successfully.

6.4.5 Modify password: (control zone password, application zone 1 password, application zone 2 password)

Host sends:

0x02	Communication length L 2 byte	0x3A	0x35	Zone code	New password length Len byte	0x03	BCC

Communication length L=3+ New password length len

Zone code=0x30 modify control zone password, password data:2 byte

=0x31 modify application zone 1 password, password data :6 byte

=0x32 modify application zone 2 password password data :4 byte

Reader returns:

0x02	0x00	0x04	0x3A	0x35	Zone code	Operation status P	0x03	BCC

P= 'Y' (0X59) modify password successful

P= 'N' (0X4E) modify password failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

Only under the safety mode 1 and checked main password then the password can be modified.

After entered safety mode 2, password can only be checked not be modified.

6.4.6 Personalized operation, enable card enter safety mode 2

HOST SENDS:

0x02	0x00	0x03	0x3A	0x36	Operation mode F	0x03	BCC

Operation mode F=0x30 enable card enter safety mode 2, for test,

F=0x31 enable the simulation enter safety mode 2,and card return to safety mode 1.

F=0x32 enable card enter safety mode 2 completely, It cannot return card to safety mode 1 in case operated the card in safety mode 2.

Reader returns:

0x02	0x00	0x04	0x3A	0x36	Operation mode F	Operation status P	0x03	BCC

P= 'Y' (0X59) personalized operation successful

P= 'N' (0X4E) personalized operation failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

Before enter safety mode 2, Make sure of the password of application zone 1, 2 have been set. The 1st byte of application zone 1: (0x16) and the 1st byte of application zone 2: (0x5C). They are the authorization of control these units. Do not modify them.

If you want to write data in this zone after enter safety mode 2, notice that the whole block of application zone will be erased, so make sure to save the data before new data written in.

Simultaneity, these application zones are under control of the fuse counter. If the fuse counter works, it will be written less then 128 times. And if the fuse counter doesn't works, the write times will be the max card write operation times (100,000 times)

6.4.7 The zone 2 erase counter operation byte EC2, Set to be invalidate operation

Host sends:

0x02	0x00	0x02	0x3A	0x37	0x03	BCC

Reader returns:

0x02	0x00	0x03	0x3A	0x37	Operation status P	0x03	BCC

P= 'Y' (0X59) successful

P= 'N' (0X4E) failure

P= 'E' (0X45) no card in reader

P='W' (0X57) Card is not at the permitted operation position

Executing this operation before entering the personalized operation is unlimited the erase times of card application zone 2 under safety mode 2. Otherwise, after complete the setting of mode 2, the card application zone 2 defaults erase times limit is effective under safety mode 2 (128 times). There's no way to cancel the 128 erase times limit, if the erase limit in the zone 2 canceled. Also, when the setting is no limited under mode 2, it can not change to limited mode.

At the same time, user should save the EC2 operation status; 'cause applications under mode 2, when the card erase and write application zone 2 (the erase password parity of application zone 2) should notice the relevant parameter

7. AT88S1604 Card Operation

7.1 Reset

Host sends:

0x02	0x00	0x02	0x3B	0x30	0x03	BCC

Reader returns:

0x02	0x00	0x03	0x3B	0x30	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) successful
P= 'N' (0X4E) failure
P= 'E' (0X45) no card in reader
P='W' (0X57) card is not at the permitted operation position

7.2 Parity password:

Host sends:

0x02	0x00	0x05	0x3B	0x31	Password type code 1 byte	Password data 2 byte	0x03	BCC

Reader returns:

0x02	0x00	0x04	0x3B	0x31	Password zone code	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) successful
P= 'N' (0X4E) failure
P= 'F' (0X46) card unused or application block unused
P= 'E' (0X45) no card in reader
P='W' (0X57) card is not at the permitted operation position

Password type code: = 0x30 main password parity
= 0x31 application zone 1 password parity
= 0x32 application zone 1 erase password parity
= 0x33 application zone 2 password parity
= 0x34 application zone 2 erase password parity
= 0x35 application zone 3 password parity
= 0x36 application zone 3 erase password parity
= 0x37 application zone 4 password parity
= 0x38 application zone 4 erase password parity

7.3 Read data:

Host sends:

0x02	0x00	0x06	0x3B	0x32	Zone code 1 byte	Operation address 2 byte	Operation length 1 byte	0x03	BCC

Reader operation successful returns: P= 'Y' (0x59)

0x02	Communication length L 2 byte	0x3B	0x32	Zone code	Operation status P	Operation address 2 byte	Operation length 1 byte	data n byte	0x03	BCC

Communication length: L= 7 + n byte

Reader operation failure returns:

0x02	0x00	0x07	0x3B	0x32	Zone code	Operation status byte P	Operation address 2 byte	Operation length 1 byte	0x03	BCC

P= 'N' fail to read

P= 'E' no card in reader

P='W' (0X57) card is not at the permitted operation position

Operation address range: 0x000----0x7FF operation length: 0x01-0x80

Zone code: = 0x30 zone 1 (0x020 --- 0x21A)

= 0x31 zone 2 (0x21B --- 0x420)

= 0x32 zone 3 (0x421 ---- 0x621)

= 0x33 zone 4 (0x622 ---- 0x7F5)

= 0x34 other zone (zones except zone 1, 2, 3)

7.4 Erase data

Host sends:

0x02	0x00	0x06	0x3B	0x33	Zone code 1 byte	Operation address 2 byte	Operation length 1 byte	0x03	BCC

Reader returns:

0x02	0x00	0x04	0x3B	0x33	Zone code	Operation status byte P	0x03	BCC

P= 'Y' (0x59) successful

P= 'N' (0x4E) failure

P = 'E' (0x45) no card in reader

P='W' (0X57) card is not at the permitted operation position

Operation address range: 0x000----0x7FF operation length: 0x01-0x80

7.5 Write data:

Host sends:

0x02	Communication length L 2 byte	0x3B	0x34	Zone code 1 byte	Operation address 2 byte	Operation length 1 byte	Write data length n byte	0x03	BCC

Communication length L = 6 + n byte

Reader returns:

0x02	0x00	0x04	0x3B	0x34	Zone code	Operation status byte P	0x03	BCC

P= 'Y' (0x59) successful

P= 'N' (0x4E) failure

P= 'E' (0x45) no card in reader

P='W' (0X57) card is not at the permitted operation position

Operation address range: 0x000----0x7FF operation length: 0x01-0x80

Zone code: = 0x30 zone 1 (0x020 --- 0x21A)

= 0x31 zone 2 (0x21B --- 0x420)

= 0x32 zone 3 (0x421 ---- 0x621)

= 0x33 zone 4 (0x622 ---- 0x7F5)

= 0x34 other zone (zones except zone 1, 2, 3)

7.6 Modify password under mode 1:

Host sends:

0x02	0x00	0x05	0x3B	0x35	Password type code 1 byte	Password data 2 byte	0x03	BCC

Reader returns:

0x02	0x00	0x04	0x3B	0x35	Password zone code	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) successful

P= 'N' (0X4E) failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

Password type code: = 0x30 main password parity

= 0x31 application zone 1 password parity

= 0x32 application zone 1 erase password parity

= 0x33 application zone 2 password parity

= 0x34 application zone 2 erase password parity

= 0x35 application zone 3 password parity

= 0x36 application zone 3 erase password parity

= 0x37 application zone 4 password parity

= 0x38 application zone 4 erase password parity

Can only modify password under safety mode 1, under safety mode 2 can only parity password ,cannot modify the password.

7.7 Personalized operation (Under safety mode 2)

Host sends:

0x02	0x00	0x03	0x3B	0x36	Operation code	0x03	BCC

Operation code = 0x30 simulate personalize operation (for test)

= 0x31 quit personalize operation

= 0x32 personalized operation completely, cannot return

Reader returns:

0x02	0x00	0x04	0x3B	0x36	Operation code	Operation status byte P	0x03	BCC

Operation status byte P= 'Y' (0X59) successful

P= 'N' (0X4E) failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

8. AT45D041 Card Operation (2048 pages storage, each: 264 byte)

8.1 Reset

Host sends:

0x02	0x00	0x02	0x3C	0x30	0x03	BCC

Reader returns:

0x02	0x00	0x03	0x3C	0x30	Operation status byte P		0x03	BCC

Operation status byte P= 'Y' (0X59) successful
P= 'N' (0X4E) failure
P= 'E' (0X45) no card in
P='W' (0X57) card is not at the permitted operation position

8.2 Read data: only support page read (264 byte)

Host sends:

0x02	0x00	0x04	0x3C	0x31	Page address 2 byte		0x03	BCC

Reader operation successful returns: P= 'Y' (0X59) read card successful

0x02	0x01	0x0D	0x3C	0x31	Operation status byte P	Page address 2 byte		264 byte card data	0x03	BCC

Reader operation failure return:

0x02	0x00	0x05	0x3C	0x31	Operation status byte P		Page address 2 byte		0x03	BCC

Operation status byte P= 'N' (0X4E) read card failure
P= 'E' (0X45) no card in reader
P='W' (0X57) card is not at the permitted operation position

Page address: 0x0000---0x07FF

8.3 Write data: only support page write (264 byte)

Host sends:

0x02	0x01	0x0C	0x3C	0x31	Page address 2 byte	264 byte card data	0x03	BCC

Reader returns:

0x02	0x00	0x05	0x3C	0x31	Operation status byte P	Page address 2 byte		0x03	BCC

Operation status byte P= 'Y' (0X59) write card successful
P= 'N' (0X4E) fail to write
P= 'E' (0X45) no card in
P='W' (0X57) card is not at the permitted operation position

9. SIM Card Operation (for SIM card operation)

9.1 Reset SIM card:

Host sends:

0x02	0x00	0x03	0x3D	0X30	SIM card No.	0x03	BCC

Reader operation successful returns: T=0 SIM card reset successfully and return operation status byte P= 'Y' (0X59)

0x02	Communication length 2 byte	0x3D	0x30	SIM card No.	operation status byte P	Reset data package length 2 byte	Reset data n byte	0x03	BCC

Data package length=6+ reset data length n

Reader operation successful returns: T=1 SIM card reset successfully and return operation status byte P= 'Z' (0X5A)

0x02	Communication length 2 byte	0x3D	0x30	SIM card No.	operation status byte P	Reset data package length 2 byte	Reset data n byte	0x03	BCC

Data package length=6+ reset data length n

SIM card connector No.=0x30 operation SIM card 1
=0x31 operation SIM card 2
=0x32 operation SIM card 3
=0x33 operation SIM card 4
=0x34 operation SIM card 5
=0x35 operation SIM card 6
=0x36 operation SIM card 7
=0x37 operation SIM card 8

Reader operation failure returns:

0x02	0x00	0x03	0x3D	0x30	SIM card No.	operation status byte P	0x03	BCC

P= 'N' (0X4E) fail to reset

9.2 T=0 SIM card C-APDU command operation:

0x02	Communication package length 2 byte	0x3D	0x31	SIM card No.	C-APDU package length 2 byte	C-APDU package n byte	0x03	BCC

Communication package length =5+ C-APDU package length n (n=4--263byte)

Reader operation successful returns: operation status byte P= 'Y' (0X59)

0x02	Communication	0x3D	0x31	SIM	operation	C-APDU	C-APDU	0	B

	package length 2 byte			card No.	status byte P	operation returns package length 2 byte	operation returns package n byte	x 0 3	C C

Communication package length =6+ C-APDU operation returns package length n (n=4--263byte)

9.3 T=1 SIM card C-APDU command operation:

0x02	Communication package length 2 byte	0x3D	0x32	SIM card No.	C-APDU package length 2 byte	C-APDU package n byte	0x03	BCC

Communication package length =5+ C-APDU package length n (n=4--263byte)

Reader operation successful returns: operation status byte P= 'Y' (0X59)

0x02	Communication package length 2 byte	0x3D	0x32	SIM card No.	operation status byte P	C-APDU operation returns package length 2 byte	C-APDU operation returns package n byte	0 x 0 3	B C C

Communication package length =6+ C-APDU operation returns package length n (n=4--263byte)

Reader operation failure returns:

0x02	0x00	0x04	0x3D	0x32	SIM card No.	operation status byte P	0x03	BCC

P= 'N' (0X4E) failure

10. Magnetic Card Operation

The initialized reading mode is reading track 1, 2, 3 via ASCII code after card reader power on. When reset the reader, still ASCII mode

10.1 According to the appointed mode read appointed tracks data

Host sends:

0x02	0x00	0x04	0x45	0x30	Read card mode	Appointed track	0x03	BCC

Read card mode: 0x30 ASCII code read data

0x31 binary code read data

Appointed track code: 0x30 do not read any track

0x31 read track 1

0x32 read tracks 2

0x33 read tracks 3

0x34 read track 1, 2

0x35 read track 2, 3

0x36 read 1, 3 tracks

0x37 read all 3 tracks

Reader returns:

0x02	Communication length n byte	0x45	0x30	Card reading mode	Appointed track No.	data package n byte of track 1, 2, 3	0x03	BCC

Communication length: N = 4 + 3 tracks data length

Reading mode: =0x30 be set to ASCII code reading mode, the upload data is in ASCII coding

=0x31 be set to binary code reading mode, the upload data is in binary coding

Notice: The format of binary code read data is:

Track 1: b0, b1, b2, b3, b4, P

Track 2, 3: b0, b1, b2, b3, P

Data package format of each tracks:

Starting byte + reading status byte + data of tracks

Starting byte: 0x1F

Reading status byte: 0x59 correct data information of track if reading successful

0x4E wrong information if reading error

0x4F can not read, track data is 0xE0

Error information:

0xE1 error, no STX

0xE2 error, no EXT

0xE3 error, no VRC

0xE4 error, wrong LRC

0xE5 error, blank track

When it is set in ASCII code reading mode, data of each track is uploaded in one byte ASCII code.

Eg, First byte of track 1 0x03 (HEX)

Uploading data package is 0x33 (ASCII)

When it is set in binary code reading mode, data of each track is uploaded in 4 bit per unit in ASCII code.

Eg, First byte of track 1 0x03 (HEX)

Uploading data package is 0x30 0x33

10.2. According to the appointed mode read appointed tracks data again. (Only for CRT-310-X2XX)

Host sends:

0x02	0x00	0x04	0x45	0x31	Read card mode	Appointed track	0x03	BCC

Read card mode: 0x30 ASCII code read data

0x31 binary code read data

Appointed track code: 0x30 do not read any track

0x31 read track 1

0x32 read tracks 2

0x33 read tracks 3

0x34 read track 1, 2

0x35 read track 2, 3

0x36 read track 1, 3

0x37 read track 1, 2, 3

Reader returns:

0x02	Communication length N byte	0x45	0x31	Card reading mode	Appointed track	data package n byte of track 1, 2, 3	0x03	BCC

Communication length: N = 4 + 3 tracks data length

Reading mode: =0x30 be set to ASCII code reading mode, the upload data is in ASCII coding

=0x31 be set to binary code reading mode, the upload data is in binary coding

Notice: The format of binary code read data is:

Track 1: b0, b1, b2, b3, b4, P

Track 2, 3: b0, b1, b2, b3, P

Data package format of each tracks:

Starting byte + reading status byte + data of tracks

Starting byte: 0x1F

Reading status byte: 0x59 correct data information of track if reading successful

0x4E wrong information if reading error

0x4F can not read, track data is 0xE0

Error information:

0xE1 error, no STX

0xE2 error, no EXT

0xE3 error, no VRC

0xE4 error, wrong LRC

0xE5 error, blank track

When it is set in ASCII code reading mode, data of each track is uploaded in one byte ASCII code.

Eg, First byte of track 1 0x03 (HEX)

Uploading data package is 0x33 (ASCII)

When it is set in binary code reading mode, data of each track is uploaded in 4 bit per unit in ASCII code.

Eg, First byte of track 1 0x03 (HEX)

Uploading data package is 0x30 0x33

Fail operation returns

0x02	0x00	0x05	0x45	0x31	Reading card mold	Appoint the track	Error status byte P	0x03	BCC

Error status byte P= 'N' (0X4E) read card failure

P= 'E' (0X45) no card in reader

P='W' (0X57) card is not at the permitted operation position

10.3 CRT284 Card Read Command Setting (only fit for CRT284)

Host sends

0x02	0x00	0x06	0x46	0x30	Reading card mode	Uploading control	Appointed track NO	0X31	0X03	BCC

Reading card mode: 0x30 reading card data in ASCII code

0x31 reading card data in binary code

Uploading control: 0x30 enable to upload the mag card data (if using this way to, it suggests not use

the reading card command to read data of mag card)

0x31: prohibit to upload the mag card data (if you set it to this mode, you can use magnetic card reading command to get the data of mag card)

Track 1: b0, b1, b2, b3, b4, P

Track 2, 3: b0, b1, b2, b3, P

Appointed track code: 0x30 do not read any track

0x31 read track 1

0x32 read tracks 2

0x33 read tracks 3

0x34 read track 1, 2

0x35 read track 2, 3

0x36 read track 1, 3

0x37 read track 1, 2, 3

Reader return:

0x02	0x00	0x07	0x46	0x30	Reading card mode	Uploading control	Appointed track NO	0X31	S	0x03	BCC

S=0X59 Set successful

S=0X4E Set failed

Note: Hold the card for a second after fully insert the card, and then pull out.

Command of clearing data from reader (For CRT-284)

Host sends

0x02	0x00	0x02	0x47	0x30	0X03	BCC

Reader return:

0x02	0x00	0x03	0x47	0x30	S	0X03	BCC

S= ‘Y’ 0X59 Set successful

S= ‘N’ 0X4E Set failed

10.4 CRT287 Card Read Command Setting (only fit for CRT287)

Host sends

0x02	0x00	0x05	0x46	0x30	Reading card mode	Uploading control	Appointed track NO	0X03	BCC

Reading card mode: 0x30 reading card data in ASCII code

0x31 reading card data in binary code

Uploading control: 0x30 enable to upload the mag card data (if using this way to, it suggests not use the reading card command to read data of mag card)

0x31: prohibit to upload the mag card data (if you set it to this mode, you can use magnetic card reading command to get the data of mag card)

Track 1: b0, b1, b2, b3, b4, P

Track 2, 3: b0, b1, b2, b3, P

Appointed track code: 0x30 do not read any track

0x31 read track 1

0x32 read tracks 2

0x33 read tracks 3

0x34 read track 1, 2

0x35 read track 2, 3

0x36 read track 1, 3

0x37 read track 1, 2, 3

Reader return:

0x02	0x00	0x06	0x46	0x30	Reading card mode	Uploading control	Appointed track NO	S	0x03	BCC

Note: Communication process please refer to the description of 6.3 of<<CRT card reader communication protocol (V3)>>