WBM-5000 MOTOR CARD READER

Version 2.1

CONTENT

I. INTRODUCTION

1. BRIEF INTRODUCTION

WBM-5000 series(with RS-232 interface) is a mini motor driven type hybrid card reader that can read the magnetic card compatible with ISO7811/7816 ,and read/write IC card ,RFID card.

CARD Standard：
* Magnetic card：Compatible with ISO7811.
* IC card, Memory card and Atmel series card.
 Encrypt card: SLE（4418/4428/4442）
 CPU card：T=0 and T=1.
* RF card TYPE A.

2. MODEL SPECIFICATION

MODEL	MAGNETIC CARD	PROTECTION DOOR + IC CARD MODULE	SAM CARD MODULE	RF CARD MODULE
WBM58	7:Track1&2&3	1: Without protection door and IC card module 6: Without protection door 7: Without IC card module 8: With protection door and IC card module	S0: No S1: One S2: Two S3: Three S4: Four	0: No 1: Yes

MODEL （WBM-5X-XX-X ）	DIMENSION	PROTECTION DOOR + IC				SAM	RF
	L*W*H(mm)	Without Protection Door &IC	Without Protection Door	Without IC	With Protection Door &IC	S(n) n stand for SAM Quantity	
WBM587X-SX-0		5871-SX-0	5876-SX-0	5877-SX-0	5878-SX-0	587X-S0-0	No
WBM587X-SX-1	215*65*61	5871-SX-1	5876-SX-1	5877-SX-1	5878-SX-1	587X-S0-1	Yes

3. FUNCTIONS

3.1. Mechanical design complies with the requirements of industry standard.

3.2. Decode triple track magnetic card compatible with ISO standard.

3.3. Shutter solenoid with inductive magnetic head and sensor.

    (1) Sensor function: Detect the inserted card
    (2) Width sensor: Detect the card is available or not
    (3) Inductive magnetic head: detect the data of inserted card.

3.4. If any cards settle in the reader, it will be ejected automatically when power on.

3.5. The communication of IC card can be synchronization and a synchronism.

8PCS IC connects with each IC card very good, even the card is not smoothly.

3.6. If the card distorted and poor contact, it will be ejected automatically.

II. STRUCTURE

RS-232 connection
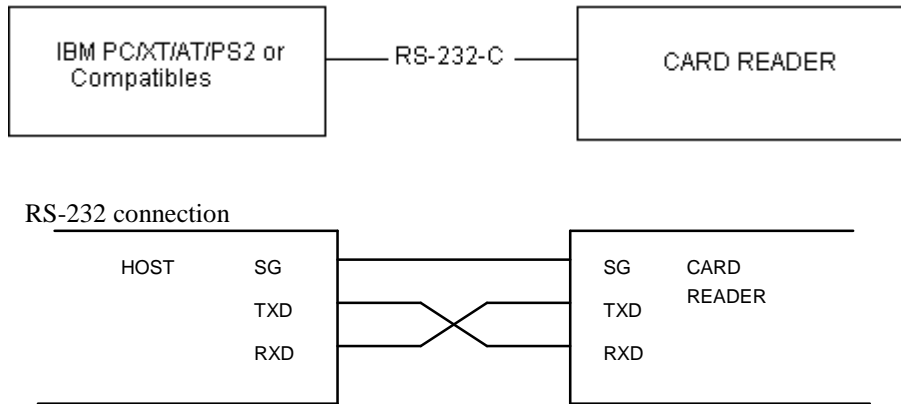
III. SPECIFICARION

1. Card standard

1.1. Magnetic card

Card standard	ISO 7811		
Track	ISO(1) (IATA)	ISO(2) (ABA)	ISO(3) (MINTS)
Reading	F2F		
Card thickness	Rubber wheel: 0.76 ± 0.08 mm		

1.2. IC card connector position and size(IC card: ISO 7816 section 2)
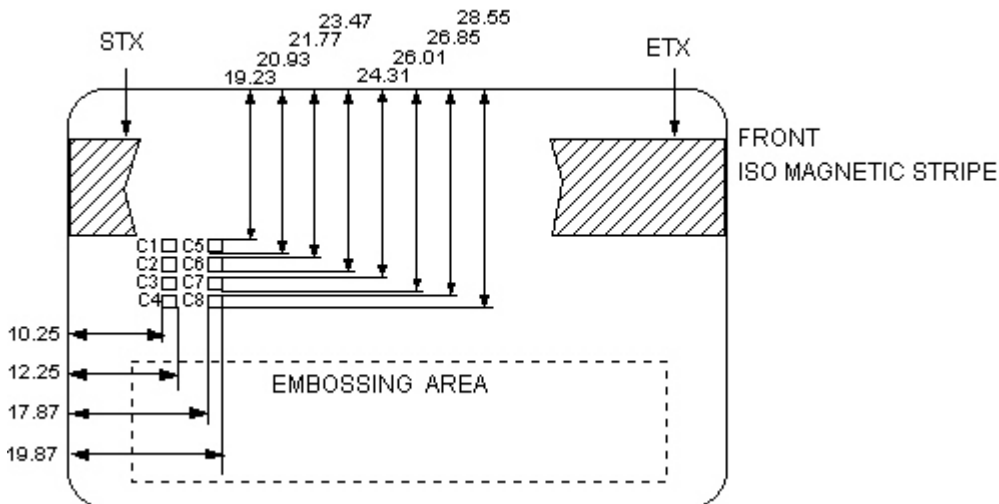
Connector character

C1	Power supply(VCC)	C5	(GND)
C2	Reset(RST)	C6	Unused
C3	CLK)	C7	(I/O)
C4	(RFU)	C8	(RFU)

1.3. RF card None

2. Environment requirement

2.1. Temperature

(1)Storage: -20°C ~ 70°C

(2)Operating: 5°C ~ 50°C

2.2. Relative Humidity

(1)Storage: 0 ~ 95%
(2)Operating: 0 ~ 90%

3. Characteristic

3.1. Weight: about 1,000g
3.2. Power requirement

(1) Voltage	: 12V DC $\pm$ 5%
(2) Power consume	: Less than 1A (12V DC, 50msec)
Motor in working	: Less than 400mA (12V DC)
Card insertion	
(3) Baud fluctuation	: Less than 200mVp-p (12V DC)
	Less than 50mVp-p (5V DC)

3.3. Operation Locus: Indoor use

4. Operation

4.1. Card speed: 470 mm/sec $\pm$ 20%
4.2. Life of Head: Min. 1,000,000 times (1 time: go forward/backward)
4.3. Mechanism section:
    Strap: 700,000 cycles
    Gear: 700,000 cycles

5. Flexural card

It means there is camber on the face of the card.
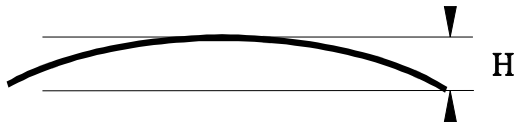
H = 3.0 mm (the maxima acceptable camber when card insertion)
    2.0 mm (the maxima acceptable camber when reading)
The figure of the flexural card
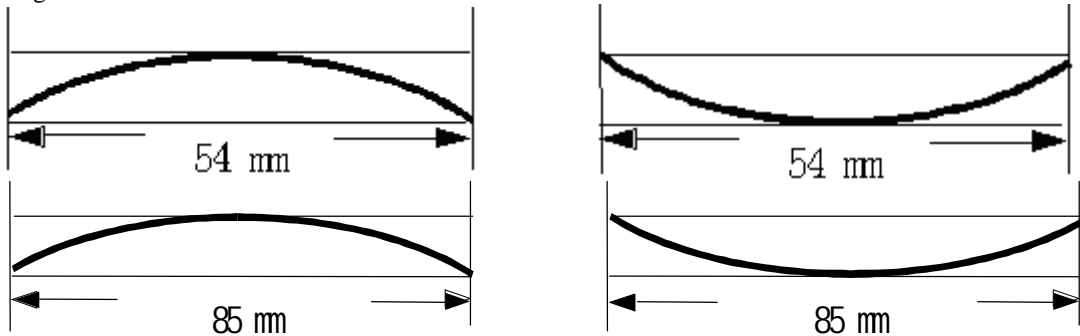
IV. INTERFACE AND SWITCHES

1. Interface

1.1. RS-232 interface(For example: Interface board, CN2(5PIN),as below：
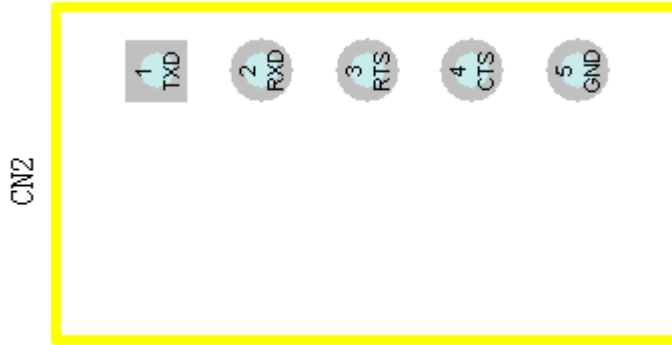
RS-232-C Signal	MSRW CN2	Input/Output	Function
TXD	1	O	Data sending
RXD	2	I	Data receiving
RTS	3	O	sending request
CTS	4	I	Erase
SG	5	GND	Grounding

1.2.Plug(For example: interface board , CN1(4PIN),As below：
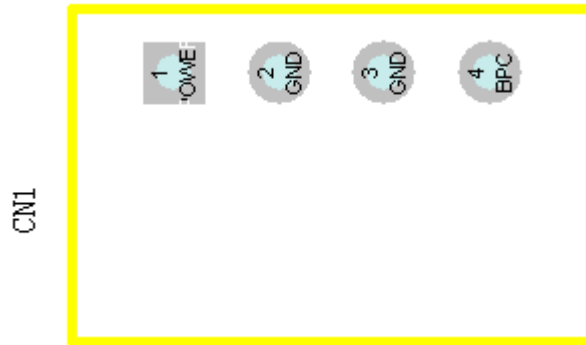
Pin No.	Signal	Function
1	12V	+12 VDC
2	GND	Grounding
3	GND	Grounding
4	BPC	Backup power

2. SWITCHES

2.1. Interface board ,Switches ☞ SW1（mounting）
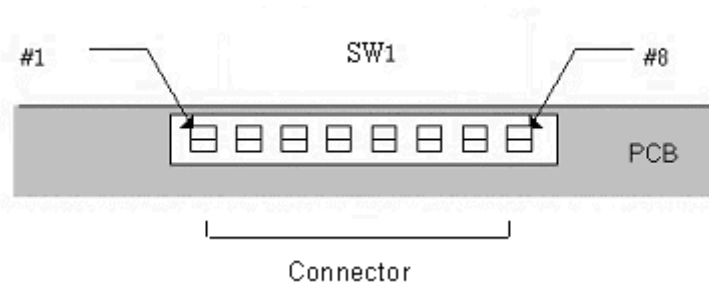
(1) Track:

S/W 1	S/W 2	S/W 3	Track
OFF	OFF	ON	ISO- 1

OFF	ON	OFF	ISO- 2
ON	OFF	OFF	ISO- 3
ON	ON	ON	ISO- 1,2,3
OFF	ON	ON	ISO- 1,2
ON	ON	OFF	ISO- 2,3
OFF	OFF	OFF	Unused

(2) Baud rate : 9600, 19200, 38400, and 57600

SW4	SW5	Baud Rate
OFF	OFF	9600(default)
OFF	ON	19200
ON	OFF	38400
ON	ON	57600

Note: data length:8 bits verify (non),start bit 1,stop bit 1. character : ASCII

(3) Function

SW6	SW7	SW8	Function select
OFF	OFF	OFF	No EMV function(default)
OFF	ON	ON	Have EMV function(Backup)
ON	OFF	OFF	Program download(Backup)

V. COMMUNICATE PROTOCOL

1. Communication data format

Communication	Asynchronous communication, half duplex
Start bit	1bit
Data bit	8bits
Verify bit	No
Stop bit	1bit
Default baud rate	9600bps

2. Data packet format

Send command packet format

| STX | SELEN | CM | PM | SE_DATAB | ETX | BCC |

SELEN length range

BCC Calculation range
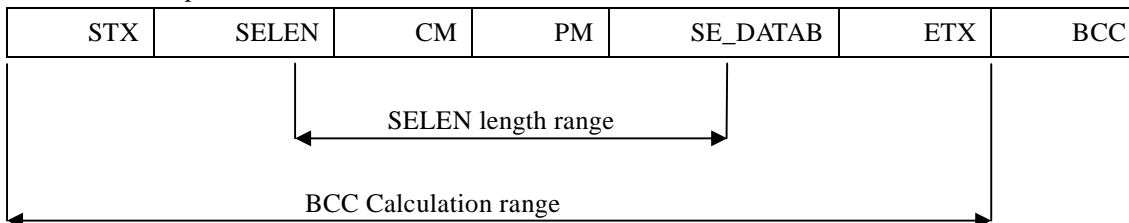
Correct return packet format

| STX | RELEN | 'P' | CM | PM | RE_DATAB | ETX | BCC |

RELEN length range
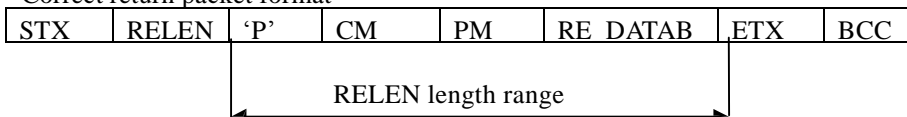
Error return packet format

STX	RELEN	'N'	CM	PM	ERR_CD	ETX	BCC

Explanation：

[1]CM,command code.

[2]PM, command parameters.

[3]SE_DATAB, the send data packets.

[4]RE_DATAB, the returned data packets.

[5]ERR_CD, error code.

[6] BCC, XOR check sum. Calculation：From STX（Include STX）to each data between ETX （Include ETX）

[7] 'P', =0x50.Indicate the command is successful.

[8] 'N', =0x4E.Indicate the command is fails.

[9]SELEN, length of the send data packet. Length is two bytes.

[10]RELEN, length of returned data packet. Length is two byte.

[11]STX start Fixed：0X02

[12] ETX end Fixed：0x03

Communication process:

Correct communication process:

Master controller：COMMAND   ENQ

Card reader：   ACK   RESPONSE
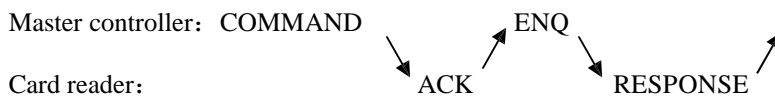
Error occurred communication process:

[1]No response

Master controller：COMMAND COMMAND   EOT

Card reader：   EOT

[2]No response

Master controller：COMMAND   ENQ   EOT

 Card reader：   ACK   EOT

[3]BCC error

Master controller：COMMAND (bcc error)   COMMAND   ENQ

Card reader：   NAK   ACK   RESPONSE
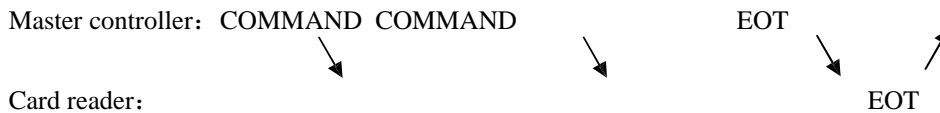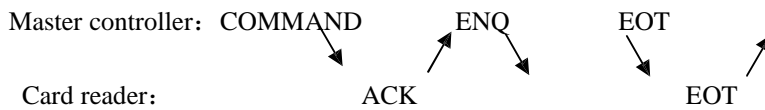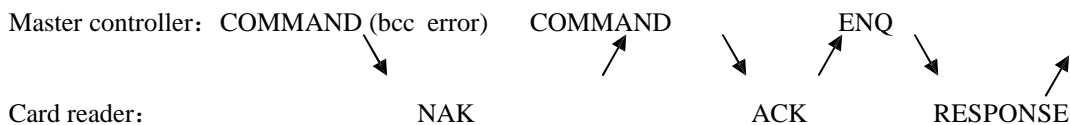
Explanation：

[1]COMMAND：Command packets

[2] RESPONSE：Response packets

[3]ACK：Control character, length is one byte, Positive response, value =0x06.

[4]NAK：Control character, length is one byte, Negative response, value=0x15.

[5]ENQ：Control character, length is one byte, Perform command request, value=0x05.

[6]EOT：Control character, length is one byte, cancel command, Value=0x04

Note：ACK, NAK, ENQ, EOT those four control characters, are sent by single character, not need to add prefix or suffix.

For example：Positive response data to host should be：0x06.

3. Command list

Command NO.	Command name	Command code	Command parameters	Command function
1	Reset card reader	0X30	0x30	Initialize card reader and no action
			0x31	Initialize card reader and eject card
			0x32	Initialize card reader and swallow card
			0x33	Initialize card reader and reentry card
2	Read the card reader state	0x31	0x30	Read the card's location in the machine
			0x31	Read each sensor status
3	Enter card set (Command valid：It failure after enter card. If the card is ejected, and need to reentry card , must be re-issued the command.)		0x30	Allows enter card (including magnetic and non-magnetic card), when the card into the machine, then respond to command.
			0x31	Only allows enter magnetic card, when the card into the machine, then respond to command.
			0x32	Back enter card, when the card into the machine, then respond to command, enter no card in 30 seconds, error response.
			0x33	Prohibit enter card. After set, any card can not enter.
			0x34	Allow enter card（Include magnetic card and non-magnetic card）,Immediately respond to a command. Whether enter the card need to query through the query command.
			0x35	Only allowed enter magnetic card, Immediately respond to a command. Whether enter the card need to query through the query command.
4	GSM card	0x33		If the machine have card inside, move the card into the card reader, (That is the RFID card position, the default position after enter card successfully）
			0x31	If the machine have card inside, move the card to the IC card position（IC card contact pushing and contact the card
			0x32	If the machine have card inside, move the card to the front folder position i.e., re-entry card position）

			0x33	If the machine have card inside, move the card to the back folder position
			0x34	If the machine have card inside, eject the card form front end.
			0x35	If the machine have card inside, eject the card from back end（i.e., swallow the card）
5	Auto-detection	0x34	0x30	Auto-detection IC card model
6	Indicator light 1	0x35	0x30	Off light
			0x31	Light on
			0x32	Light blink
7	Indicator light 2	0x36	0x30	Off light
			0x31	Light on
			0x32	Light blink
8	Read the magnetic card decode data	0x37	0x30	Read the data of ISO track 1
			0x31	Read the data of ISO track 2
			0x32	Read the data of ISO track 3
			0x33	Read the data of ISO track 1&2
			0x34	Read the data of ISO track 1&3
			0x35	Read the data of ISO track 2&3
			0x36	Read the data of ISO track 1&2&3
			0x39	Clear magnetic card data
9	Read the magnetic card un-decoded data	0x38	0x30	Read the data of ISO track 1
			0x31	Read the data of ISO track 2
			0x32	Read the data of ISO track 3
			0x33	Read the data of ISO track 1&2
			0x34	Read the data of ISO track 1&3
			0x35	Read the data of ISO track 2&3
			0x36	Read the data of ISO track 1&2&3
10	CPU card operation	0x39	0x30	Activation（Fixed voltage 5v）
			0x31	Power off
			0x32	Activation（Optional voltage）
			0x33	T=0 card communication command
			0x34	T=1 card communication command
11	SAM card operation	0x3A	0x30	Activation（Fixed voltage 5v）
			0x31	Power off
			0x32	Activation（Optional voltage）
			0x33	SAM T=0 card communication command
			0x34	SAM T=1 card communication command
			0x35	Select SAM card
12	RFID card S50 operation	0x3B	0x30	Search card
			0x31	Read the serial number
			0x32	Verify password
			0x33	Read data
			0x34	Write data
			0x35	Value initialization operation
			0x36	Value-added operation
			0x37	Value decrease operation
			0x38	Stop the machine
13	RFID card S70 operation	0x3C	0x30	Search card
			0x31	Read the serial number

			0x32	Verify password
			0x33	Read data
			0x34	Write data
			0x35	Value initialization operation
			0x36	Value-added operation
			0x37	Value decrease operation
			0x38	Stop the machine
14	RFID card UL card operation	0x3D	0x30	Search card
			0x31	Read the serial number
			0x32	Read data
			0x33	Write data
			0x34	Stop the machine
15	AT24 series card operation	0x3E	0x30	Read data
			0x31	Write data
16	AT45DB041 card operation	0x3F	0x30	Reset
			0x31	Read data
17	AT88S102 card operation	0x40	0x30	Reset
			0x31	Verify password
			0x32	Read data
			0x33	Clear data(Not personalization)
			0x34	Clear the application area 1 （ Have personalization）
			0x35	Clear the application area 2 （ Have personalization）
			0x36	Write data
			0x37	Change password
			0x38	Personalization settings
			0x39	EC2 invalid
18	AT88S1604 card operation	0x41	0x30	Reset
			0x31	Verify password
			0x32	Read data
			0x33	Clear data
			0x34	Write data
			0x35	Change password
			0x36	Personalization settings
19	AT88S1608 card operation	0x42	0x30	Active contact and power on reset
			0x31	Verify password
			0x32	Read data
			0x33	Write data
			0x34	Read fuse status
			0x35	Fuse
			0x36	Initialize authentication
			0x37	Verify authentication
			0x38	Change password
20	SLE4442 card operation	0x43	0x30	Active contact and power on reset
			0x31	Verify password
			0x32	Read data
			0x33	Read protection bit
			0x34	Read PSC area
			0x35	Write data
			0x36	Write protection bit

			0x37	Change password
21	SLE4428 card operation	0x44	0x30	Reset
			0x31	Verify password
			0x32	Read data
			0x33	Read protection bit
			0x34	Write data
			0x35	Write protection bit
			0x36	Change password
22	IC card power on/off operation	0x45	0x30	Power on
			0x31	Power off
23	Set baud rate	0x46	0x30	Baud rate=1200
			0x31	Baud rate =2400
			0x32	Baud rate =4800
			0 x33	Baud rate =9600
			0x34	Baud rate =19200
			0x35	Baud rate =38400

4. Command details

4.1. Initialize command

(After execute it, need to delay 500MS to send other commands)

1.1. Initialize card reader, not action

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

PM=0X30, Initialize card reader, not do card action.

Successful return：

0x02	0x00	0x11	0x50	0x30	0x30	Version information	0x03	BCC

Version information：TTCE_M100_V2.3

Failure return:

0x02	0x00	0x04	0x4E	0x30	0x30	ERR_CD	0x03	BCC

1.2. Initialize card reader, and former eject card

0x02	0x00	0x02	0x30	0x31	0x03	BCC

PM=0X31：Initialize card reader, and eject card.

Successful return：

0x02	0x00	0x11	0x50	0x30	0x31	Version information	0x03	BCC

Version information：TTCE_M100_V2.3

Failure return：

0x02	0x00	0x04	0x4E	0x30	0x31	ERR_CD	0x03	BCC

1.3. Initialize card reader, and swallow card reader

0x02	0x00	0x02	0x30	0x32	0x03	BCC

PM=0X32：Initialize card reader, and swallow card reader

Successful return：

0x02	0x00	0x11	0x50	0x30	0x32	Version information	0x03	BCC

Version information：TTCE_M100_V2.3

Failure return：

0x02	0x00	0x04	0x4E	0x30	0x32	ERR_CD	0x03	BCC

1.4. Initialize card reader, and re-enter card

0x02	0x00	0x02	0x30	0x33	0x03	BCC

PM=0X33, Initialize card reader, and not do card action.

Successful return：

0x02	0x00	0x11	0x50	0x30	0x33	Version information	0x03	BCC

Version information：TTCE_M100_V2.3

Failure return：

0x02	0x00	0x04	0x4E	0x30	0x33	ERR_CD	0x03	BCC

4.2. Read sensor status

2.1. Read the card position in machine

0x02	0x00	0x02	0x31	0x30	0x03	BCC

Successful return：

0x02	0x00	0x04	0x50	0x31	0x30	Card position	0x03	BCC

Card position：Length is one byte.

=0x30：card in front not mounting card position.

=0x31：card in front mounting card position.

=0x32：card in rfid card position.

=0x33：card in IC card position.

=0x34：card in back mounting card position.

=0x35：no card in machine

=0x36：card is not in standard position

Failure return：

0x02	0x00	0x04	0x4E	0x31	0x30	ERR_CD	0x03	BCC

2.2 Read each sensor status

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

Successful return：

0x02	0x00	0x0A	0x50	0x31	0x31	Sensor status	0x03	BCC

Sensor status：Length is 7 bytes.

Upload sequence：PSS1, PSS2, PSS3, PSS4, PSS5, CTKSW, KSW.

=0x30：No card.

=0x31：Have card

Failure return：

0x02	0x00	0x04	0x4E	0x31	0x31	ERR_CD	0x03	BCC

4.3. Waiting to enter card set

(The machine default status is prohibit enter card and wait enter card, successfully return or until the card enter completely, after completely enter the card, return the data packet or success reply.)

3.1.Front enter card：Magnetic card and non-magnetic card can enter

0x02	0x00	0x02	0x32	0x30	0X03	BCC

Successfully return：

0x02	0x00	0x03	0x50	0x32	0x30	0x03	BCC

Failure return：

0x02	0x00	0x04	0x4E	0x32	0x30	ERR_CD	0x03	BCC

3.2. Front enter card, magnetic card can enter

0x02	0x00	0x02	0x32	0x31	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x32	0x31	0x03	BCC

Failure return：

0x02	0x00	0x04	0x4E	0x32	0x31	ERR_CD	0x03	BCC

3.3.Back enter card：

0x02	0x00	0x02	0x32	0x32	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x32	0x32	0x03	BCC

Failure return：

0x02	0x00	0x04	0x4E	0x32	0x32	ERR_CD	0x03	BCC

3.4.Prohibit enter card：

0x02	0x00	0x02	0x32	0x33	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x32	0x33	0x03	BCC

Failure return：

0x02	0x00	0x04	0x4E	0x32	0x33	ERR_CD	0x03	BCC

3.5.Allow enter card（include magnetic card and non-magnetic card）,immediately response to command. Whether the card enter need to check query command

0x02	0x00	0x02	0x32	0x34	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x32	0x34	0x03	BCC

Failure return：

0x02	0x00	0x04	0x4E	0x32	0x34	ERR_CD	0x03	BCC

3.6. Allow magnetic card enter, immediately response to command, whether the card enter need to check query command.

0x02	0x00	0x02	0x32	0x35	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x32	0x35	0x03	BCC

Failure return：

0x02	0x00	0x04	0x4E	0x32	0x35	ERR_CD	0x03	BCC

Explanation：

[1] Normal enter card process

Master controller：Enter card command   ENQ

Card reader：   ACK   wait card enter   return successfully after entry
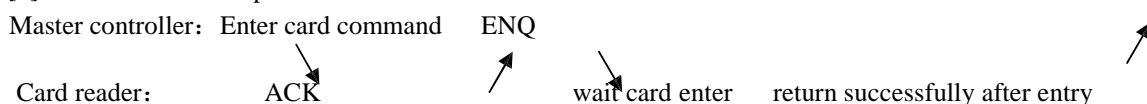
[2]Cancel enter card process

Master controller：Enter card command   ENQ   EOT

Card reader：   ACK   wait card enter   EOT
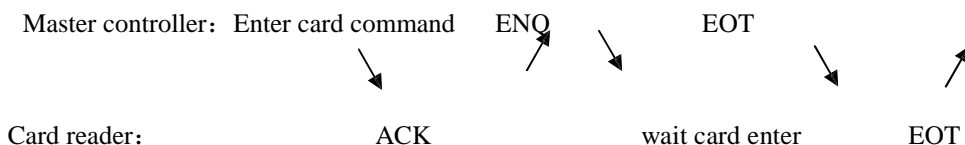
[3]Each execution of a enter card command, can only enter one card, When quit card, if you want to re-enter card, need to send the enter card command again.

4.4. JSM Card

0x02	0X00	0X02	0x33	PM	0x03	BCC

PM=0X30, move card into the machine（i.e., rfid card position, the default position after enter card）

PM=0X31, move the card to IC card contact, and pushing the IC contact

PM=0X32, move the card to front mounting card position（i.e., re-enter card position）

PM=0X33, move the card to back mounting card position.

PM=0X34，eject card from front

PM=0X35，eject card from back（i.e., swallow card）

Successful return：

0x02	0X00	0X03	0x50	0x33	PM	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x33	PM	ERR_CD	0x03	BCC

4.5. Auto-detect IC card type

0x02	0X00	0X02	0x34	0x30	0x03	BCC

Successful return：

0x02	0X00	0X03	0x50	0x34	0x30	CARDTP	0x03	BCC

[1]CARDTP：Card type

CARDTP=0X30：AT24C01

CARDTP=0X31：AT24C02

CARDTP=0X32：AT24C04

CARDTP=0X33：AT24C08

CARDTP=0X34：AT24C16

CARDTP=0X35：AT24C32

CARDTP=0X36：AT24C64

CARDTP=0X37：AT45DB041

CARDTP=0X38：AT102

CARDTP=0X39：AT1604

CARDTP=0X3A：AT1608

CARDTP=0X3B：SLE4442

CARDTP=0X3C：SLE4428

CARDTP=0X3D：CPU T=0

CARDTP=0X3E：CPU T=1

CARDTP=0XFF：Not identified card type

Failure return：

0x02	0X00	0X04	0x4E	0x34	0x30	ERR_CD	0x03	BCC

4.6. Indicator light 1 operation

0x02	0X00	0X02	0x35	PM	0x03	BCC

PM=0X30：Light off

PM=0X3：Light on

PM=0X3：Light blink Successful return：

0x02	0X00	0X03	0X50	0x35	PM	0x03	BCC

Failure return：

0x02	0X00	0X04	0X4E	0x35	PM	ERR_CD	0x03	BCC

4.7. Indicator light 2 operation

0x02	0X00	0X02	0x36	PM	0x03	BCC

PM=0X30：Light off

PM=0X31：Light on

PM=0X32：Light blink

Successful return：

0x02	0X00	0X03	0X50	0x36	PM	0x03	BCC

Failure return：

0x02	0X00	0X04	0X4E	0x36	PM	ERR_CD	0x03	BCC

4.8. Read magnetic card decode data

Explanation：

[1]0XFA，Start character of track 1

[2]0XFB，Start character of track 2

[3]0XFC，Start character of track 3

[4]TRX_ST，read status of each track.

=0x60, read magnetic card correctly

=0x61，SS error

=0x62，ES error

=0x63，P error

=0x64，LRC error

=0x65，Blank track

8.1. Read data of ISO track 1

0x02	0x00	0x02	0x37	0x30	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x30	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN	Data

Failure return:

0X02	0X00	0X04	0X4E	0X37	0X30	ERR_CD	0X03	BCC

8.2. Read data of ISO track 2

0x02	0x00	0x02	0x37	0x31	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x31	Magnetic Card Data Packet	0x03	BCC

Magnetic card data packet format：

TR2_ST	LEN	Data

Failure return:

0X02	0X00	0X04	0X4E	0X37	0X31	ERR_CD	0X03	BCC

8.3. Read data of ISO track 3

0x02	0x00	0x02	0x37	0x32	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x32	Magnetic Card Data Packet	0x03	BCC

Magnetic card data packet format：

TR3_ST	LEN	Data

Failure return：

0X02	0X00	0X04	0X4E	0X37	0X32	ERR_CD	0X03	BCC

8.4. Read data of ISO track 1&2

0x02	0x00	0x02	0x37	0x33	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x33	Magnetic Card Data Packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN1	TR2_ST	LEN2	TR1 data	TR2 data

Failure return：

0X02	0X00	0X04	0X4E	0X37	0X33	ERR_CD	0X03	BCC

8.5. Read data of ISO track 1&3

0x02	0x00	0x02	0x37	0x34	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x34	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN1	TR3_ST	LEN2	TR1 data	TR3 data

Failure return：

0X02	0X00	0X04	0X4E	0X37	0X34	ERR_CD	0X03	BCC

8.6. Read data of ISO track 2&3

0x02	0x00	0x02	0x37	0x35	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x35	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR2_ST	LEN1	TR3_ST	LEN2	TR2 data	TR3 data

Failure return：

0X02	0X00	0X04	0X4E	0X37	0X35	ERR_CD	0X03	BCC

8.7. Read data of ISO track 1&2&3

0x02	0x00	0x02	0x37	0x36	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x37	0x36	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN1	TR2_ST	LEN2	TR3_ST	LEN3	Track1 Data	Track2 Data	Track3 Data

Failure return：

0X02	0X00	0X04	0X4E	0X37	0X36	ERR_CD	0X03	BCC

8.8. Clear the magnetic card data in the card reader buffer

0X02	0X00	0X02	0X37	0X39	0X03	BCC

Successful return：

0X02	0X00	0X03	0X50	0X37	0X39	0X03	BCC

Failure return：

0X02	0X00	0X04	0X4E	0X37	0X39	ERR_CD	0X03	BCC

4.9. Read magnetic card un-decoded data

Explanation：

[1]0XFA，Starting character of track 1.

[2]0XFB，Starting character of track 2.

[3]0XFC，Starting character of track 3.

[4]TRX_ST，read status of each track.

    =0x60，read magnetic card correctly

    =0x65，blank track

9.1. Read data of track 1

0x02	0x00	0x02	0x38	0x30	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x30	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN	data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x30	ERR_CD	0X03	BCC

9.2. Read data of track 2

0x02	0x00	0x02	0x38	0x31	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x31	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR2_ST	LEN	data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x31	ERR_CD	0X03	BCC

9.3. Read data of track 3

0x02	0x00	0x02	0x38	0x32	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x32	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR3_ST	LEN	data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x32	ERR_CD	0X03	BCC

9.4. Read data of track 1&2

0x02	0x00	0x02	0x38	0x33	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x33	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN1	TR2_ST	LEN2	TR1 data	TR2 data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x33	ERR_CD	0X03	BCC

9.5. Read data of track1&3

0x02	0x00	0x02	0x38	0x34	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x34	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN1	TR3_ST	LEN2	TR1 data	TR3 data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x34	ERR_CD	0X03	BCC

9.6. Read data of track 2&3

0x02	0x00	0x02	0x38	0x35	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x35	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR2_ST	LEN1	TR3_ST	LEN2	TR2 data	TR3 data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x35	ERR_CD	0X03	BCC

9.7. Read data of track 1&2&3

0x02	0x00	0x02	0x38	0x36	0X03	BCC

Successful return：

0x02	RLEN_H	RLEN_L	0X50	0x38	0x36	Magnetic card data packet	0x03	BCC

Magnetic card data packet format：

TR1_ST	LEN1	TR2_ST	LEN2	TR3_ST	LEN3	TR1 data	TR2 data	TR3 data

Failure return：

0X02	0x00	0x04	0X4E	0X38	0x36	ERR_CD	0X03	BCC

4.10. CPU card operation

10.1.CPU card active IC contact，Fixed voltage 5V

Explanation：

[1]CARD_TP：CPU card type Length is one byte；=0X30，indicate T=0卡；=0X31，indicated T=1 card.

[2]RLEN：The length of reset information. Length is one byte.

[3]RESET_DATA：reset information，Length is determined by RLEN

[4]BLEN：length of data packet，Length is two bytes，the first byte storage high-order of data packet length，the second byte storage low-order of data packet length

0X02	0X00	0X02	0X39	0x30	0X03	BCC

Successful return：

0x02	BLEN	0x50	0x39	0x30	RLEN	CARD_TP	RESET_DATA	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x39	0x30	ERR_CD	0X03	BCC

10.2. Power off

0x02	0X00	0X02	0x39	0x31	0x03	BCC

Successful return：

0X02	0X00	0X03	0X50	0X39	0X31	0X03	BCC

Failure return：

0X02	0X00	0X04	0X4E	0X39	0X31	ERR_CD	0X03	BCC

10.3.CPU card activation，optional voltage(1.8v,3v,5v)

Explanation：

[1]CARD_TP：CPU card type. Length is one byte；=0X30，indicated T=0 card；=0X31，indicated T=1card.

[2]RLEN：The length of reset information. Length is one byte.

[3]RESET_DATA：reset information，Length is determined by RLEN.

[4]BLEN：length of data packet，Length is two bytes，the first byte storage high-order of data packet length，the second byte storage low-order of data packet length

0x02	0X00	0X02	0x39	0x32	PT	0x03	BCC

PT=0X30: Power on voltage is 1.8v

PT=0X31: Power on voltage is 3v

PT=0X32: Power on voltage is 5v

Successful return：

0x02	BLEN	0x50	0x39	0x32	RLEN	CARD_TP	RESET_DATA	0x03	BCC

Failure return：

0x02	0x00	0x04	0x39	0x32	0x45	ERR_CD	0X03	BCC

10.4. T=0 card communication command

Explanation：

[1]SELEN_H,SELEN_L: Send data packet length，each length of one byte

[2]SELEN: Command packet length, length is two bytes（The first byte have high-order ofT0_CMD length, the second byte have low-order of TO CMD length.

[3]T0_CMD：T=0 command packet，length = SELEN first byte x 256 ＋ SELEN second byte

[4]RELEN_H,RELEN_L：Return data packet length，each length is one byte

[5] RE_LEN: length of executing return to the result by command，length is two bytes（the first byte storage the high-order of RE_DATA length，the second byte storage the low-order of RE_DATA length.）

[6]RED_ATA：returned packet，length= RE_LEN first byte x 256+RE_LEN second byte

[7] ERR_CD：error code，one byte

0x02	SELEN_H	SELEN_L	0x39	0x33	SELEN	T0_CMD	0x03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x39	0x33	RE_LEN	RE_DATA	0x03	BCC

Failure return：

0x02	0X00	0X04	0x45	0x39	0x33	ERR_CD	0X03	BCC

10.5.T=1 card communication command

Explanation：

[1]SELEN_H,SELEN_L: Send data packet length，each length is one byte

[2]SELEN: command packet length，length is two bytes The first byte have high-order of T1_CMD length, the second byte have low-order of T1_CMD length.

[3]T1_CMD：T=0 command packet，length= SELEN first byte x 256 ＋ SELEN second byte

[4]RELEN_H,RELEN_L：return packet length，each length is one byte

[5] RE_LEN: length of executing return to the result by command，length is two bytes（the first byte storage the high-order of RE_DATA length，the second byte storage the low-order of RE_DATA length.）

[6]RE_DATA：returned packet，length= RE_LEN the first byte x 256+RE_LEN second byte

[7] ERR_CD：error code，one byte

0x02	SELEN_H	SELEN_L	0x39	0x34	SELEN	T1_CMD	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x39	0x34	RE_LEN	RE_DATA	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x39	0x34	ERR_CD	0X03	BCC

4.11. SAM card operation

11.1.SAM card active IC card contact，Fixed voltage is (5v)

Explanation：

[1]SAM_TP：SAM card type. length is one byte；=0X30，indicated T=0 card；=0X31，indicated T=1card.

[2]RLEN：Length of reset information, length is one byte.

[3]RESET_DATA：Reset information, length is determined by RLEN

0X02	0X00	0X02	0X3A	0x30	0X03	BCC

Successful return：

0x02	RELEN	0x50	0x3A	0x30	RLEN	SAM_TP	RESET_DATA	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3A	0x30	ERR_CD	0X03	BCC

11.2. Power off

0x02	0X00	0X02	0x3A	0x31	0x03	BCC

Successful return：

0X02	0X00	0X03	0X50	0X3A	0X31	0X03	BCC

Failure return：

0X02	0X00	0X04	0X4E	0X3A	0X31	ERR_CD	0X03	BCC

Explanation：

[1]SAM_TP：SAM card type. Length is one byte；=0X30，indicated T=0 card；=0X31，indicated T=1card.

[2]RLEN：Length of reset information, length is one byte.

[3]RESET_DATA：Reset information, length is determined by RLEN

0x02	0X00	0X02	0x3A	0x32	PT	0x03	BCC

PT=0X30: power on voltage is1.8v
PT=0X31: power on voltage is 3v
PT=0X32: power on voltage is 5v

Successful return：

0x02	RELEN	0x50	0x3A	0x32	RLEN	SAM_TP	RESET_DATA	0x03	BCC

Failure return：

0x02	0x00	0x04	0x3A	0x32	0x45	ERR_CD	0X03	BCC

11.4.SAM T=0 card communication command

Explanation：

[1]SELEN_H,SELEN_L：Send data packet length, each length is one byte.

[2]SELEN: command packet length, length is two bytes, (the first byte storage the high-order of T0_CMD length, the second byte storage the low-order of T0_CMD length）

[3]T0_CMD：T=0 command packet，length= SELEN first byte x 256 ＋ SELEN second byte

[4]RELEN_H,RELEN_L：Returned packet length, each length is one byte.

[5] RE_LEN: length of executing return to the result by command，length is two bytes（the first byte storage the high-order of RE_DATA length，the second byte storage the low-order of RE_DATA length.）

[6]RE_DATA：Returned packet，length= RE_LEN first byte x 256 +RE_LEN second byte

[7] ERR_CD：error code，one byte

0x02	SELEN_H	SELEN_L	0x3A	0x33	SELEN	T0_CMD	0x03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0X50	0x3A	0x33	RLEN	RE_DATA	0x03	BCC

Failure return：

0x02	0X00	0X04	0x45	0x3A	0x33	ERR_CD	0X03	BCC

11.5.SAM T=1 card communication command

Explanation：

[1]SELEN_H,SELEN_L: Length of send data packet，each length is one byte.

[2]SELEN: length of command packet, length is two bytes,（the first byte storage the high-order of T1_CMD length, the second byte storage the low-order of T1_CMD length）

[3]T1_CMD：T=0 command packet，length= SELEN first byte x 256 + SELEN second byte

[4]RELEN_H,RELEN_L：Length of returned packet, each length is one byte.

[5] RE_LEN: length of executing return to the result by command，length is two bytes（the first byte storage the high-order of RE_DATA length，the second byte storage the low-order of RE_DATA length.）

[6]RE_DATA：returned packet，length= RE_LEN first byte x 256 + RE_LEN second byte

[7] ERR_CD：error code，one byte

0x02	SELEN_H	SELEN_L	0x3A	0x34	SELEN	T1_CMD	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x3A	0x34	RLEN	RE_DATA	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3A	0x34	ERR_CD	0X03	BCC

11.6. SAM card select command

Explanation：

[4] SAM_NUM：SAM card sequence，one byte（Total 8 set，effective value 0x30-0x38 total 8）

0x02	0x00	0x03	0x3A	0x35	SAM_NUM	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x3A	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3A	0x35	ERR_CD	0X03	BCC

4.12. RFID card S50 operation command

12.1. Search card

0x02	0x00	0x02	0x3B	0x30	0X03	BCC

Successful return：

0x02	0X00	0X03	0x50	0x3B	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x30	ERR_CD	0X03	BCC

12.2. Read card serial number

0x02	0x00	0x02	0x3B	0x31	0X03	BCC

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x3B	0x31	卡序列号	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x31	ERR_CD	0X03	BCC

12.3. Verify password

0x02	0x00	0x0a	0x3B	0x32	Block address	Password type	6 bytes password	0X03	BCC

Explanation：

Password type:=0X30,verify KEYA;=0X31, verify KEYB

password：Length is 6 bytes sector password.

Successful return：

0x02	0x00	0x03	0x50	0x3B	0x32	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x32	ERR_CD	0X03	BCC

12.4. Read data

0x02	0x00	0x03	0x3B	0x33	Block address	0X03	BCC

Successful return：

0x02	0x00	0x13	0x50	0x3B	0x33	16 bytes data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x33	ERR_CD	0X03	BCC

12.5. Write data

0x02	0x00	0x13	0x3B	0x34	Block address	16 bytes data	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3B	0x34	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x34	ERR_CD	0X03	BCC

12.6. Value initialization operation

0x02	0x00	0x13	0x3B	0x35	Block address	16 bytes data	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3B	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x35	ERR_CD	0X03	BCC

Explanation：Initialized value format as follows,

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

Value：To initialize a 4 byte value, note that the low byte first, high byte in the post.

/Value: The initialized 4 bytes value negation

Adr: The block address of the initialized value

Adr= Sector number X 4 + block number (S50 card 0-15 sectors，S70 card 0 −31sectors block value operation address computation)

Adr=（ Sector number – 32 ） X 16 + 128 + block number （ S70 card 32 – 39 sector value operation address computation）

/Adr: The block address negation of he value to be initialized

Note！: Each sector last block can not be value operation.

Such as：Initialized the fifth sector 0 to 10，block address need to write in 16 byte sector is：

" 0x0A, 0x00, 0x00, 0x00, 0xF5 0xFF,0xFF ,0xFF , 0x0A, 0x00, 0x00, 0x00, 0x14, 0xEB, 0x14, 0xEB"

S70 cad the39 sector 0, initialized value is 10，block address need to write in 16 byte sector is：

" 0x0A, 0x00, 0x00, 0x00, 0xF5, 0xFF,0xFF ,0xFF , 0x0A, 0x00, 0x00, 0x00, 0xF0, 0x0F, 0XF0, 0x0F

12.7. Value-added operation

0x02	0x00	0x07	0x3B	0x36	Block address	4bytes value-added data	0X03	BCC

Explanation：value-added data，low byte first，high byte in the post.

Successful return：

0x02	0x00	0x03	0x50	0x3B	0x36	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x36	ERR_CD	0X03	BCC

4 byte hex Data are the increased value of the specified block in specified sector.（low byte first, high byte in the post.）If add 0x10.Sent 4 byte hex data is："0x10, 0x00, 0x00, 0x00"

12.8. Value decrease operation

0x02	0x00	0x07	0x3B	0x37	Block address	4bytes value decrease data	0X03	BCC

Explanation：Value decrease data，low byte first, high byte in the post.

Successful return：

0x02	0x00	0x03	0x50	0x3B	0x37	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x37	ERR_CD	0X03	BCC

4 byte hex Data are the increased value of the specified block in specified sector.（low byte first, high byte in the post）If decrease 0x10，Sent 4 byte hex data is："0x10, 0x00, 0x00, 0x00"

12.9. Stop operation

0x02	0x00	0x02	0x3B	0x38	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3B	0x38	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3B	0x38	ERR_CD	0X03	BCC

4.13. RFID Card S70 operation

13.1. Search card

0x02	0x00	0x02	0x3C	0x30	0X03	BCC

Successful return：

0x02	0X00	0X03	0x50	0x3C	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x30	ERR_CD	0X03	BCC

13.2. Read card serial number

0x02	0x00	0x02	0x3C	0x31	0X03	BCC

Successful return：

0x02	0X00	0X07	0x50	0x3C	0x31	4bytes serial number	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x31	ERR_CD	0X03	BCC

13.3. Verify password

0x02	0x00	0x0A	0x3C	0x32	Block address	Password type	6bytes password	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3C	0x32	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x32	ERR_CD	0X03	BCC

13.4. Read data

0x02	0x00	0x03	0x3C	0x33	Block address	0X03	BCC

Successful return：

0x02	0x00	0x13	0x50	0x3C	0x33	16bytes data block	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x33	ERR_CD	0X03	BCC

13.5. Write data

0x02	0x00	0x13	0x3C	0x34	Block address	16bytes data block	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3C	0x34	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x34	ERR_CD	0X03	BCC

13.6. Value initialization operation

0x02	0x00	0x13	0x3C	0x35	Block address	16bytes data block	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3C	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x35	ERR_CD	0X03	BCC

Initialized value format as follows,

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

Value: To initialize a 4 byte value, note that the low byte first, high byte in the post.

/Value: The initialized 4 bytes value negation

Adr: The block address of the initialized value

   Adr= Sector number X 4 + block number (S50 card 0-15 sectors，S70 card 0 −31sectors block value operation address computation)

   Adr=（ Sector number − 32 ） X 16 + 128 + block number （ S70 card 32 − 39 sector value operation address computation）

/Adr: The block address negation of the value to be initialized

Note：Each sector last block can not be value operation.

Such as：Initialized the fifth sector 0 to 10，block address need to write in 16 byte sector is：

   S70 card the39 sector 0, initialized value is 10，block address need to write in 16 byte sector is：

   " 0x0A, 0x00, 0x00, 0x00, 0xF5, 0xFF,0xFF ,0xFF , 0x0A, 0x00, 0x00, 0x00, 0xF0, 0x0F, 0XF0, 0x0F"

13.7. Value-added operation

0x02	0x00	0x07	0x3C	0x36	Block address	4bytes value-added data	0X03	BCC

Explanation：Value-added data, low byte first, high byte in the post.

Successful return：

0x02	0x00	0x03	0x50	0x3C	0x36	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x36	ERR_CD	0X03	BCC

13.8. Value decrease operation

0x02	0x00	0x07	0x3C	0x37	Block address	4bytes value decrease data	0X03	BCC

Explanation: value decrease data，low byte first, high byte in the post.

Successful return：

0x02	0x00	0x03	0x50	0x3C	0x37	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x37	ERR_CD	0X03	BCC

13.9. Stop operation

0x02	0x00	0x02	0x3C	0x38	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3C	0x38	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3C	0x38	ERR_CD	0X03	BCC

4.14. RFID Card UL card operation

14.1. Search card

0x02	0x00	0x02	0x3D	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3D	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3D	0x30	ERR_CD	0X03	BCC

14.2. Read serial number

0x02	0x00	0x02	0x3D	0x31	0X03	BCC

Successful return：

0x02	0x00	0x0a	0x50	0x3D	0x31	7bytes serial number	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3D	0x31	ERR_CD	0X03	BCC

14.3. Read operation

0x02	0x00	0x03	0x3D	0x32	Block address	0X03	BCC

Successful return：

0x02	0x00	0x13	0x50	0x3D	0x32	16bytes data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3D	0x32	ERR_CD	0X03	BCC

14.4. Write operation

0x02	0x00	0x13	0x3D	0x33	Block address	16bytes data	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3D	0x33	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3D	0x33	ERR_CD	0X03	BCC

Note：Block address 0~1 can only be read but not write，block address2~3 have special meaning，carefully input.

14.5. Stop

0x02	0x00	0x07	0x3D	0x34	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3D	0x34	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3D	0x34	ERR_CD	0X03	BCC

4.15. AT 24 series card operation

15.1. Write data

0x02	0x00	0x05	0x3E	0x30	CARDTP	RDLEN	ADDR	0X03	BCC

[1]ADDR：Read data initial address, length is two bytes.

[2]RDLEN：Read data length, length is one byte, must be less than or equal to256.

[3]CARDTP：Card type

    CARDTP=0X30：AT24C01

    CARDTP=0X31：AT24C02

    CARDTP=0X32：AT24C04

    CARDTP=0X33：AT24C08

    CARDTP=0X34：AT24C16

    CARDTP=0X35：AT24C32

    CARDTP=0X36：AT24C64

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x3E	0x30	Data packet	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3E	0x30	ERR_CD	0X03	BCC

15.2. Write data

0x02	SELEN_H	SELEN_L	0x3E	0x31	CARDTP	WLEN	ADD R	Data packet	0X03	BCC

1]ADDR：Initial address of write data，length is two byte.

[2]Length：Effective value 0X01~0XFF

[3]Data packet：Length must be less than or equal to256.

Successful return：

0x02	0x00	0x03	0x50	0x3E	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3E	0x31	ERR_CD	0X03	BCC

4.16. AT 45DB041 card operation

16.1. Reset

0x02	0x00	0x02	0x3F	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x3F	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3F	0x30	ERR_CD	0X03	BCC

16.2. Read data

0x02	0x00	0x04	0x3F	0x31	ADDR	0X03	BCC

[1]ADDR：Read data page address, length is two byte.

Successful return：

0x02	0x01	0x0B	0x50	0x3F	0x31	264bytes data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3F	0x31	ERR_CD	0X03	BCC

16.3. Write data

0x02	0X01	0X0C	0x3F	0x32	ADDR	264bytes data	0X03	BCC

[1]ADDR：Initial address of write data，length is two byte.

Successful return：

0x02	0x00	0x03	0x50	0x3F	0x32	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x3F	0x32	ERR_CD	0X03	BCC

4.17. AT88S102 card operation

17.1. Reset

0x02	0x00	0x02	0x40	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x40	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x30	ERR_CD	0X03	BCC

17.2. Verify password

0x02	0x00	0x04	0x40	0x31	2bytes password	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x40	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x31	ERR_CD	0X03	BCC

17.3. Read data

0x02	0x00	0x04	0x40	0x32	address	length	0X03	BCC

[1]address：Initial address of read data, length is one byte.

[2]Length：Length of read data, length is one byte.

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x40	0x32	Data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x32	ERR_CD	0X03	BCC

17.4. Clear data, before personalization

0x02	0x00	0x04	0x40	0x33	address	Length	0X03	BCC

[1]Address：Initial address of clearing data, length is one byte.

[2]Length：Length of clearing data, length is one byte

Successful return：

0x02	0x00	0x03	0x50	0x40	0x33	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x33	ERR_CD	0X03	BCC

17.5. Clear the application area 1, card have been personalized.

0x02	0x00	0x08	0x40	0x34	6 bytes of area 1 erase password	0X0	BCC

Successful return：

0x02	0x00	0x03	0x50	0x40	0x34	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x34	ERR_CD	0X03	BCC

17.6. Clear the application area 2, card have been personalized.

0x02	0x00	0x07	0x40	0x35	PM	4bytes area2 clear password	0X03	BCC

Explanation：

PM=0X30，clear when not fuse

PM=0X31, clear when fuse Successful return：

0x02	0x00	0x03	0x50	0x40	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x35	ERR_CD	0X03	BCC

17.7. Write data

0x02	SELEN_H	SELEN_L	0x40	0x36	address	Length	Data packet	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x40	0x36	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x36	ERR_CD	0X03	BCC

17.8. Verify password

0x02	SELEN_H	SELEN_L	0x40	0x37	Password type	password	0X03	BCC

Explanation：

[1]Password type：

=0X30：Verify master password, length is two bytes.

=0X31：Verify clear password in area 1，length is 6 bytes.

=0X32：Verify clear password in area 2 length is 6 bytes.

Successful return：

0x02	0x00	0x03	0x50	0x40	0x37	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x37	ERR_CD	0X03	BCC

17.9. Personalization operation

0x02	0x00	0x03	0x40	0x38	Work mode	0X03	BCC

Explanation：

[1]Work mode：

=0X30：Pseudo-personalization, can recover.

=0X31：Exit pseudo-personalization.

=0X32：Real-personalization, can not recover.

Successful return：

0x02	0x00	0x03	0x50	0x40	0x38	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x38	ERR_CD	0X03	BCC

17.10. Second area clear the counter operation word EC2 set to invalid operation

HOST sent：

0x02	0x00	0x02	0x40	0x39	0x03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x40	0x39	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x40	0x39	ERR_CD	0X03	BCC

Note： To make erase times unlimited of application area 2 in safe mode 2, should execute this operation before entering the personalization. Otherwise, after completing mode 2 settings, the default erase times of application area 2 is limited (only 128 times). If you want to cancel application area 2 erase times unlimited, then can not cancel the limited erase times (128 times) of application area 2, Can not set the erase times limited after set the erase times unlimited in mode 2, at the same time, users have to stored the EC2 operation status. Card in mode 2, should be note the corresponding parameters to erase application area 2 (verify the erase password in application area 2).

4.18. AT88S1604 card operation

18.1. Reset

0x02	0x00	0x02	0x41	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x41	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x41	0x30	ERR_CD	0X03	BCC

18.1. Verify password

0x02	0x00	0x05	0x41	0x31	password type	2bytes password	0X03	BCC

Explanation：

= 0x30   verify master password

= 0x31   verify application area 1 password

= 0x32   verify application area 1 clear password

= 0x33   verify application area 2 password

= 0x34   verify application area 2 clear password

= 0x35   verify application area 3 password

= 0x36   verify application area 3 clear password

= 0x37   verify application area 4 password

= 0x38   verify application area 4 clear password

Successful return：

0x02	0x00	0x03	0x50	0x41	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x41	0x31	ERR_CD	0X03	BCC

18.2. Read data

| 0x02 | 0x00 | 0x05 | 0x41 | 0x32 | address | Length | 0X03 | BCC |

[1]Address：Initial address of read data, length is two bytes.

[2]Length：Length of read data, length is one byte.

Successful return：

| 0x02 | RELEN_H | RELEN_L | 0x50 | 0x41 | 0x32 | data | 0x03 | BCC |

Failure return：

| 0x02 | 0X00 | 0X04 | 0x4E | 0x41 | 0x32 | ERR_CD | 0X03 | BCC |

18.3. Clear data

| 0x02 | 0x00 | 0x05 | 0x41 | 0x33 | address | Length | 0X03 | BCC |

[1]Address：Initial address of clear data, length is two bytes.

[2]Length：Length of clear data, length is one byte.

Successful return：

| 0x02 | 0x00 | 0x03 | 0x50 | 0x41 | 0x33 | 0x03 | BCC |

Failure return：

| 0x02 | 0X00 | 0X04 | 0x4E | 0x41 | 0x33 | ERR_CD | 0X03 | BCC |

18.4. Write data

| 0x02 | SELEN_H | SELEN_L | 0x41 | 0x3 | address | length | Data packet | 0X03 | BCC |

[1]Address：Initial address of clear data, length is two bytes.

[2]Data packet: data to be written in, the length can not exceed 256.

Successful return：

| 0x02 | 0x00 | 0x03 | 0x50 | 0x41 | 0x34 | 0x03 | BCC |

Failure return：

| 0x02 | 0X00 | 0X04 | 0x4E | 0x41 | 0x34 | ERR_CD | 0X03 | BCC |

18.5. Change password, before the card personalization.

| 0x02 | 0x00 | 0x05 | 0x41 | 0x35 | Password type | 2bytes password | 0X03 | BCC |

explanation：

[1password type：

= 0x30   Change master password

= 0x31   Change application area 1 password

= 0x32   Change application area 1 clear password

= 0x33   Change application area 2 password

= 0x34   Change application area 2 clear password

= 0x35   Change application area 3 password

= 0x36   Change application area 3 clear password

= 0x37   Change application area 4 password

= 0x38   Change application area 4 clear password

Successful return：

| 0x02 | 0x00 | 0x03 | 0x50 | 0x41 | 0x35 | 0x03 | BCC |

Failure return：

| 0x02 | 0X00 | 0X04 | 0x4E | 0x41 | 0x35 | ERR_CD | 0X03 | BCC |

18.6. Personalization

| 0x02 | 0x00 | 0x03 | 0x41 | 0x36 | Work mode | 0X03 | BCC |

Explanation：

[1]work mode：

=0X30：Pseudo-personalization, can recover.

=0X31：Exit pseudo-personalization.

=0X32：Real-personalization, can not recover.

Successful return：

| 0x02 | 0x00 | 0x03 | 0x50 | 0x41 | 0x36 | 0x03 | BCC |

Failure return：

0x02	0X00	0X04	0x4E	0x41	0x36	ERR_CD	0X03	BCC

4.19. AT88S1608 card operation

19.1. Reset

0x02	0x00	0x02	0x42	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x42	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x30	ERR_CD	0X03	BCC

19.2. Verify password

0x02	0x00	0x06	0x42	0x31	Password type	3bytes password	0X03	BCC

Explanation：

Password type：

    = 0x30   verify application area 1 to read password

    = 0x31   verify application area 2 to read password

    = 0x32   verify application area 3 to read password

    = 0x33   verify application area 4 to read password

    = 0x34   verify application area 5 to read password

    = 0x35   verify application area 6 to read password

    = 0x36   verify application area 7 to read password

    = 0x37   verify application area 8 to read password

    = 0x38   verify application area 1 to write password

    = 0x39   verify application area 2 to write password

    = 0x3A   verify application area 3 to write password

    = 0x3B   verify application area 4 to write password

    = 0x3C   verify application area 5 to write password

    = 0x3D   verify application area 6 to write password

    = 0x3E   verify application area 7 to write password/check master password

    = 0x3F   verify application area 8 to write password

Successful return：

0x02	0x00	0x03	0x50	0x42	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x31	ERR_CD	0X03	BCC

19.3. Read data

0x02	0x00	0x05	0x42	0x32	Area No.	address	length	0X03	BCC

Explanation：

    Operating address range： application area：

    0x00----0xFF

    setting area：0x00----0x80 operating length：

    0x01----0x80

    Area No.: = 0x30   Application area 1 (len=0x01—0x80)

          = 0x31   Application area 2 (len=0x01—0x80)

          = 0x32   Application area 3 (len=0x01—0x80)

          = 0x33   Application area 4 (len=0x01—0x80)

          = 0x34   Application area 5 (len=0x01—0x80)

          = 0x35   Application area 6 (len=0x01—0x80)

          = 0x36   Application area 7 (len=0x01—0x80)

          = 0x37   Application area 8 (len=0x01—0x80)

          = 0x38   setting area(len=0x01—0x80)

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x42	0x32	data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x32	ERR_CD	0X03	BCC

19.4. Write data

0x02	SELEN_H	SELEN_L	0x42	0x33	Area NO.	Address.	Length	data	0X03	BCC

Explanation：

Operation address range：

Application area：0x00----0xFF

Setting area：0x00----0x80 Operation length：

0x01----0x80

Area No.: = 0x30　　Application area 1 (len=0x01—0x80)

　　　　 = 0x31　　Application area 2 (len=0x01—0x80)

　　　　 = 0x32　　Application area 3 (len=0x01—0x80)

　　　　 = 0x33　　Application area 4 (len=0x01—0x80)

　　　　 = 0x34　　Application area 5 (len=0x01—0x80)

　　　　 = 0x35　　Application area 6 (len=0x01—0x80)

　　　　 = 0x36　　Application area 7 (len=0x01—0x80)

　　　　 = 0x37　　Application area 8 (len=0x01—0x80)

　　　　 = 0x38　　Setting area　(len=0x01—0x80)

Successful return：

0x02	0x00	0x03	0x50	0x42	0x33	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x33	ERR_CD	0X03	BCC

19.5. Read fuse status

0x02	0x00	0x02	0x42	0x34	0X03	BCC

Successful return：

0x02	0x00	0x06	0x50	0x42	0x34	FAB	CMA	PER	0x03	BCC

Explanation：

FAB：Is the factory fusing sign of ATMEL chip, after leave factory, the sign is blown.

CMA：Is the factory fusing sign of card, after leave factory, the sign is blown.

PER：IS the issuer fuse, before the start of personalization, the sign is blown.

Fuse status word FAB：　　FAB =0X30　have fused, FAB=0X31　not fuse.

Fuse status word CMA：　CMA =0X30　have fused, CMA =0X31　not fuse

Fuse status word PER：　PER =0X30　　have fused, PER =0X31　not fuse

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x34	ERR_CD	0X03	BCC

19.6. Fuse

Explanation：Execute the command each time, blow a fuse, execute three times, all fuse are blown, and can not recover.

Fuse sequence：　FAB Æ　　　CMA　　Æ PER

0x02	0x00	0x02	0x42	0x35	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x42	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x35	ERR_CD	0X03	BCC

19.7. Initialization authentication

0x02	0x00	0x0A	0x42	0x36	8 byte random No. Q0~Q7	0x03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x42	0x36	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x36	ERR_CD	0X03	BCC

Explanation：

Initialization authentication area is read the Nc, Ci in card first, through F1 or F2 computation，work out Gc=F1（Ks，Nc） get random numberQ0~Q7，sent into AT88SC1608 card, complete the initialization authentication area, the computation can be obtained from the card factory.

19.8. Verify authentication

0x02	0x00	0x0A	0x42	0x37	8 byte　random number Q0~Q7	0x03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x42	0x37	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x37	ERR_CD	0X03	BCC

Explanation：

Verify authentication area is after the operation of initialization authentication area, completed as F2 computation　Q1＝F2(Gc，Ci，Q0)，generated Q0，Q1，Q2，Q3，Q4，Q5，Q6，Q7 sent into　AT88SC1608 card to complete verify authentication area, this verification, computation can be obtained form the card factory.

19.9. Change password

0x02	0x00	0x06	0x42	0x38	Password type	3bytes password	0X03	BCC

Explanation：

Password type：

    = 0x30　Change application area 1 to read password

    = 0x31　Change application area 2 to read password

    = 0x32　Change application area 3 to read password

    = 0x33　Change application area 4 to read password

    = 0x34　Change application area 5 to read password

    = 0x35　Change application area 6 to read password

    = 0x36　Change application area 7 to read password

    = 0x37　Change application area 8 o read password

    = 0x38　Change application area 1 to write password

    = 0x39　Change application area 2 to write password

    = 0x3A　　Change application area 3 to write password

    = 0x3B　Change application area 4 to write password

    = 0x3C　Change application area 5 to write password

    = 0x3D　Change application area 6 to write password

    = 0x3E　Change application area 7 to write password/verify master password

    = 0x3F　Change application area 8 to write password

    Successful return：

0x02	0x00	0x03	0x50	0x42	0x38	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x42	0x38	ERR_CD	0X03	BCC

4.20. SLE4442 card operation

20.1. Reset

0x02	0x00	0x02	0x43	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x43	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x30	ERR_CD	0X03	BCC

20.2. Verify password

0x02	0x00	0x05	0x43	0x31	3bytes password	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x43	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x31	ERR_CD	0X03	BCC

20.3. Read data

0x02	0x00	0x04	0x43	0x32	Address	Length	0X03	BCC

Explanation：

[1]Address：Initial address of read data，Effective value：0x00~0xFF, length is one byte..

[2]Length：Length of read data.

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x43	0x32	Data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x32	ERR_CD	0X03	BCC

20.4.Read protection bit

0x02	0x00	0x02	0x43	0x33	0X03	BCC

Explanation：

[1] Address：Initial address of read data，Effective value: 0x00~0x1F, length is one byte.

[2] Length：Length of read data.

Successful return：

0x02	0x00	0x23	0x50	0x43	0x33	Data	0x03	BCC

Explanation：

[1]Data：Effective value：0X30 and 0X31.0X30 indicated the corresponding address have been protected, data can not be changed.0X31 indicated the corresponding address is not protected, data can be changed. Failure return：

0x02	0X00	0X04	0x4E	0x43	0x33	ERR_CD	0X03	BCC

20.5. Read PSC area

0x02	0x00	0x02	0x43	0x34	0X03	BCC

Successful return：

0x02	0x00	0x07	0x50	0x43	0x34	PSC area data	0x03	BCC

20.6. Write data

Explanation：PSC area data, total 4 bytes, sequence as follows,

First byte： Password error counter

Second byte: Password data1

Third byte： Password data2

Fourth byte： Password data3 Password error counter =0X07（no error）0X06（1 error）0X04（2 error）0X00（3 error，Card invalid）

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x34	ERR_CD	0X03	BCC

Explanation：You must verify password successfully before write data.

0x02	SELEN_H	SELEN_L	0x43	0x35	address	Length	Data	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x43	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x35	ERR_CD	0X03	BCC

20.7. Write protection bit

Explanation：

[1] You must verify password successfully before write data.

[2] The data of write protection bit must be the same as the data of not writer protection bit, then can write protection bit successfully.

[3]Once successful write protection bit, the corresponding address data can not be changed.

0x02	SELEN_H	SELEN_L	0x43	0x36	Address	Length	Data	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x43	0x36	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x36	ERR_CD	0X03	BCC

20.8. Change password

Explanation：

[1] You must be verifying password successfully before change password.

0x02	0x00	0x05	0x43	0x37	3bytes password	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x43	0x37	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x43	0x37	ERR_CD	0X03	BCC

4.21. SLE4428 card operation

21.1. Active contact, power on and reset

0x02	0x00	0x02	0x44	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x44	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x44	0x30	ERR_CD	0X03	BCC

21.2. Verify password

0x02	0x00	0x04	0x44	0x31	2bytes password	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x44	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x44	0x31	ERR_CD	0X03	BCC

21.3. Read data

0x02	0x00	0x05	0x44	0x32	Address	Length	0X03	BCC

Explanation：

[1]Address：Initial address of read data，effective value: 0x00~0xFF, length is two bytes.

[2]Length：Length of read data.

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x44	0x32	Data	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x44	0x32	ERR_CD	0X03	BCC

21.4. Read protection bit

0x02	0x00	0x05	0x44	0x33	address	length	0X03	BCC

Explanation：

[1] Address：Initial address of read data，effective value:0x00~0x1F, length is two bytes.

[2] Length：Length of read data

Successful return：

0x02	RELEN_H	RELEN_L	0x50	0x44	0x33	data	0x03	BCC

Explanation：

    [1]Data：Effective value：0X30 and 0X31.0X30 indicated the corresponding address have been protected, data can not be changed.

        0X31 indicated the corresponding address is not protected, data can be changed.

    Failure return：

0x02	0X00	0X04	0x4E	0x44	0x33	ERR_CD	0X03	BCC

21.5. Write data

Explanation：You must verify the password successfully before write data.

0x02	SELEN_H	SELEN_L	0x44	0x34	address	length	data	0X03	BCC

[1]Address：Length is two byte.

[2]length： length of write in data，effective value：0X00~0XFF.length is one byte.

Successful return：

0x02	0x00	0x03	0x50	0x44	0x34	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x44	0x34	ERR_CD	0X03	BCC

21.6. Write data with protection bit

Explanation：You must verify the password successfully before write data.

[2] Once write data successfully, the corresponding address data can not be changed.

0x02	SELEN_H	SELEN_L	0x44	0x35	address	Length	data	0X03	BCC

[1]Address：Length is two byte.

[2]Length：Length of write in data，effective value：0X00~0XFF.Length is one byte.

Successful return：

0x02	0x00	0x03	0x50	0x44	0x35	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x44	0x35	ERR_CD	0X03	BCC

21.7. Change password

[1] You must verify the password successfully before write data.

0x02	0x00	0x04	0x44	0x36	2bytes password	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x44	0x36	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x44	0x36	ERR_CD	0X03	BCC

4.22. IC card power on/off operation

22.1. Power on

0x02	0x00	0x02	0x45	0x30	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x45	0x30	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x45	0x30	ERR_CD	0X03	BCC

22.2. Power off

0x02	0x00	0x02	0x45	0x31	0X03	BCC

Successful return：

0x02	0x00	0x03	0x50	0x45	0x31	0x03	BCC

Failure return：

0x02	0X00	0X04	0x4E	0x45	0x30	ERR_CD	0X03	BCC

4.23. Set baud rate

0x02	0x00	0x02	0x46	PM	0X03	BCC

Explanation：

PM effective value and corresponding baud rate：

0x30	baud rate =1200
0x31	baud rate =2400

0x32	baud rate =4800
0x33	baud rate =9600
0x34	baud rate =19200
0x35	baud rate =38400

Successful return：

| 0x02 | 0x00 | 0x03 | 0x50 | 0x46 | PM | 0x03 | BCC |

Failure return：

| 0x02 | 0X00 | 0X04 | 0x4E | 0x46 | PM | ERR_CD | 0X03 | BCC |

5. Error code

Error code	Indication
Commands Error code	
0x00	Undefined commands
0x01	Commands parameter error
0x02	Commands data error
0x03	unimplemented commands
0x04	Fail to implement commands
Power supply error code	
0x05	Power supply error，over high>13v
0x06	Power supply error，over low <10v
0x07	Main power supply over low or un-exist
0x08	Sensor abnormal
Card move error code	
0x0a	Card ja-
0x0b	Fail to open shutter
0x0c	Card abnormal，longer card
0x0d	Card abnormal，shorter card
0x0e	Back in card expiry
IC card operation error code----CPU card	
0x21	CPU reset failure
0x22	T=0 CPU card commands implement failure
0x23	T=1 CPU card capacity request failure
0x24	T=1 CPU card commands implement failure
IC card operation error code ----SAM card	
0x30	SAM reset error
0x31	T=0 SAM card commands implement failure
0x32	T=1 SAM card capacity request failure
0x33	T=1 SAM card commands implement failure
IC card operation error code ----RF card	
0X40	RF card not in, RF card commands implement failure
0x41	Request card failure
0x42	Read series number failure
0x43	password verify error
0x44	Choose card failure
0x45	Read data failure
0x46	Write data failure
0x49	Add value failure
0x4a	Devalue failure
IC card operation error code ---- Memory Card，Logic encrypt card	
0x50	IC card not in，IC card commands implement failure
0x51	AT24 read error

0x52	AT24 write error
0x53	AT45DB041 reset error
0x56	AT88S1608 reset error
0x57	AT88S1608 password verify error
0x58	AT88S1608 read error
0x59	AT88S1608 write error
0x5a	AT88S1608 card write fusing error
0x5b	AT88S1608 card initialization error
0x5c	AT88S1608 card verify error
0x5d	AT88S102 reset error
0x5e	AT88S102 password verify error
0x5f	AT88S102 invalid card
0x60	AT88S10 erase error
0x61	AT88S102 write error
0x62	AT88S102 password setting error
0x63	AT88S1604 reset error
0x64	AT88S1604 password verify error
0x65	AT88S1604 invalid card
0x66	AT88S1604 erase error
0x67	AT88S1604 write error
0x68	AT88S1604 read error
0x69	SLE4442 reset error
0x6a	SLE4442 invalid card
0x6b	SLE4442 password error
0x70	SLE4428 reset failure
0x71	SLE4428 invalid card
0x72	SLE4428 password verify error
0x73	SLE4428 password setting error

VI. ENGINEERING VIEW

Interface Connector

Power(+24v) Connector

4-3.2X6 OBLONG

Top View

Side View