

Card Dispenser with RF Reader/Writer

F3 Communication Protocol

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1. Communication character format

Baud rate (BPS) **9600/192000/38400/57600BPS** (automatic recognize)

Communication mode: Asynchronism communication

Transmit mode: Semiduplex, support multi-machine communication, max 16sets machine working

Data frames structure:

| | | | | | | | | | |
|-----------|----|----|----|----|----|----|----|----|-----------|
| Start bit | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | Stop sbit |
|-----------|----|----|----|----|----|----|----|----|-----------|

Start bit: **1bit**

Data bit: **8bit**

Parity bit: no

Stop bit: **1bit**

Coding mode: **ASCII 8 Coding**

2. Communication control methods and control characte

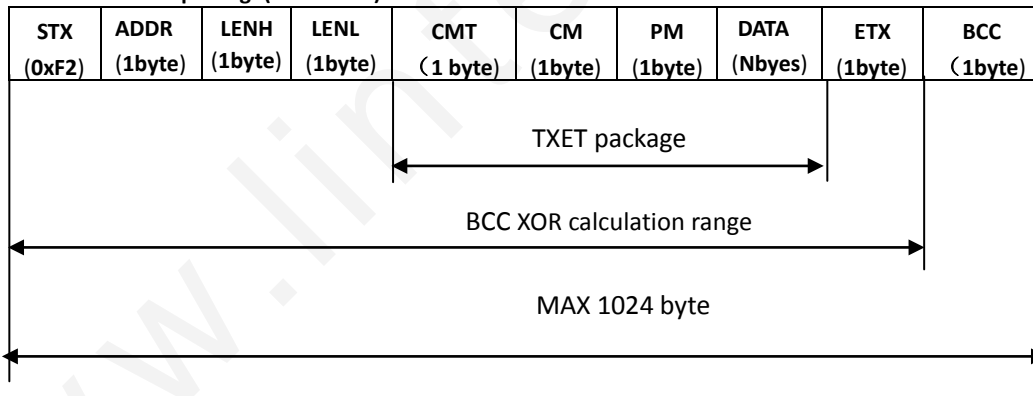
Dispenser was driven role, only receive correct command from host it can work.

Correlation control character:

- ACK (06H)** Confirm character
- NAK (15H)** Negate character
- EOT (04H)** Cancel delete character

3. Communication format and correlation character

3.1 Send command package(Command)format



STX (F2H) Start character

ADDR Address

LENH(1 byte) Send **TXET** package data length high byte

LENL(1 byte) Send **TXET** Package data length low byte

CMT Send command head('C',**43H**)

CM Send command character

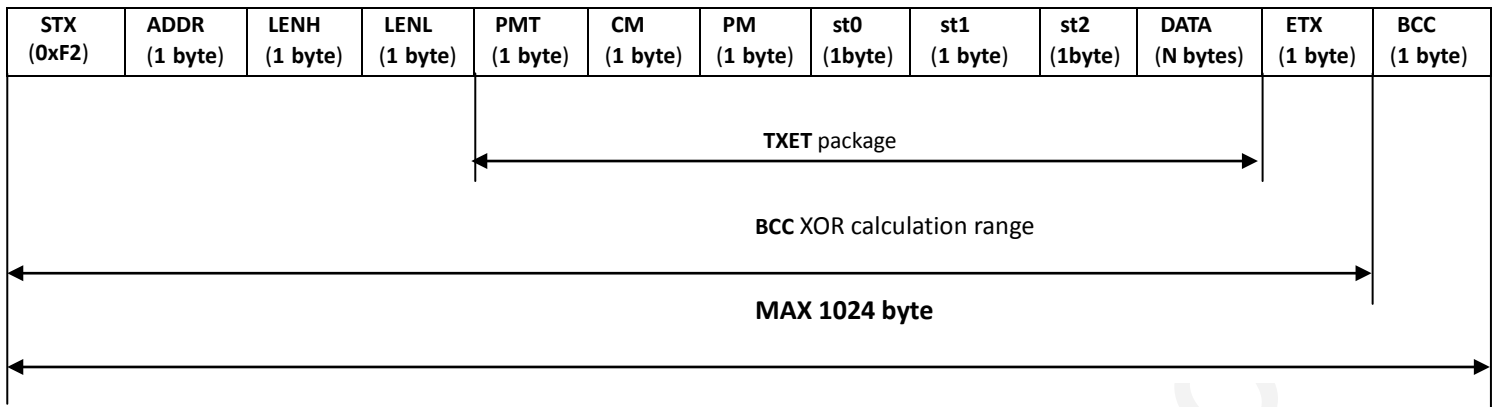
PM Send command parameter

DATA Send command data(**N byte,N=0~512**)

ETX (03H) Finish character

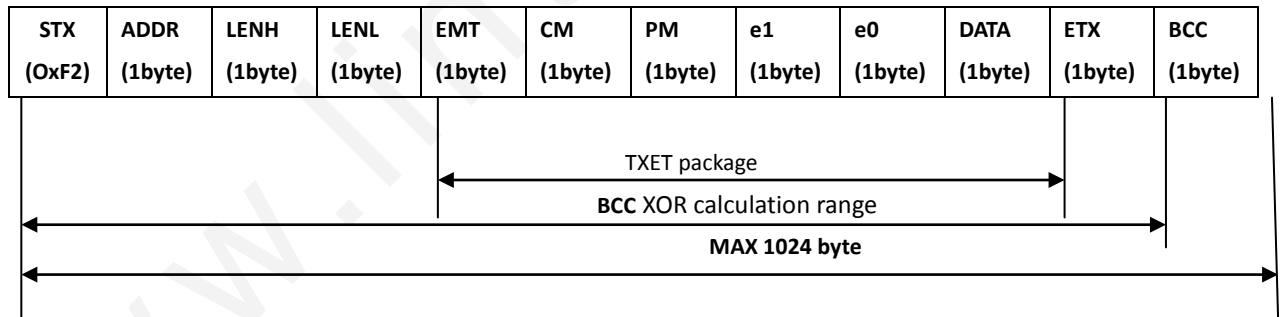
BCC(1 bytes) XOR check value

3.2 Operate success return command package(Response)format



- STX (F2H) Start character
- ADDR Address
- LENH(1 byte) ReturnTXETpackage data length high byte
- LENL(1 byte) Return TXETpackage data length low byte
- PMT Return command head('P',50H)
- CM Return command character
- PM Return command parameter
- st1,st0,st2 Return machine status code
- DATA Return command data(N byte,N=0~512)
- ETX (03H) Finish character
- BCC(1 bytes) XOR check value

3.3 Operating fail return command package(Response)format



- STX (F2H) Start character
- ADDR Address
- LENH(1 byte) ReturnTXETpackage data length high byte
- LENL(1 byte) ReturnTXETpackage data length low byte
- EMT Return command head('N',45H)
- CM Return command character
- PM Return command parameter
- e1,e0 Return machine error code
- DATA Return command data(N byte,N=0~512)
- ETX (03H) Finish character
- BCC(1 bytes) XOR check value

4. Multi-Machine Communication machine address:

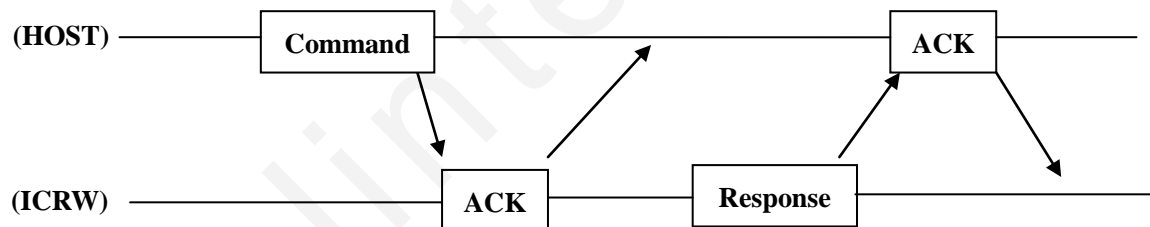
ADDR: Multi-machine working, each machine address define as following:

| Address | ADD |
|---------|-----|
| 0# | 00H |
| 1# | 01H |
| 2# | 02H |
| 3# | 03H |
| 4# | 04H |
| 5# | 05H |
| 6# | 06H |
| 7# | 07H |
| 8# | 08H |
| 9# | 09H |
| 10# | 0AH |
| 11# | 0BH |
| 12# | 0CH |
| 13# | 0DH |
| 14# | 0EH |
| 15# | 0FH |

Dispenser default address at 15#; When setting multi-machine, each unit should be set at a unique address, When operate a certain unit, in the communication package, there is a opposite address character can be selected for visit that unit.

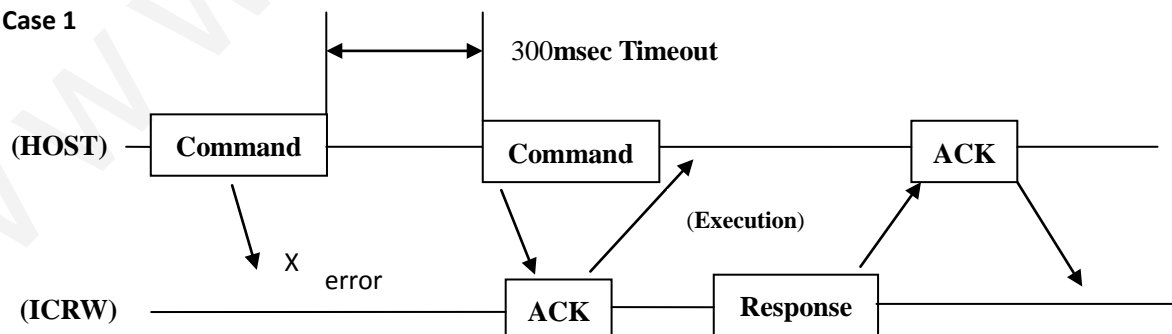
5. Dispenser communication description

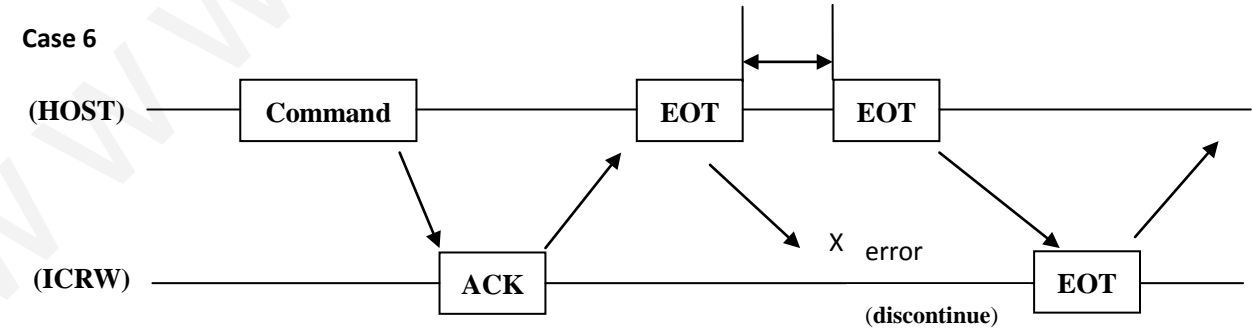
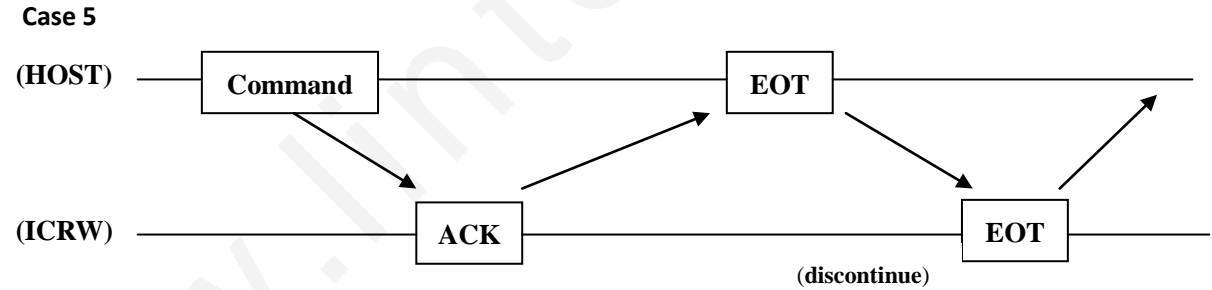
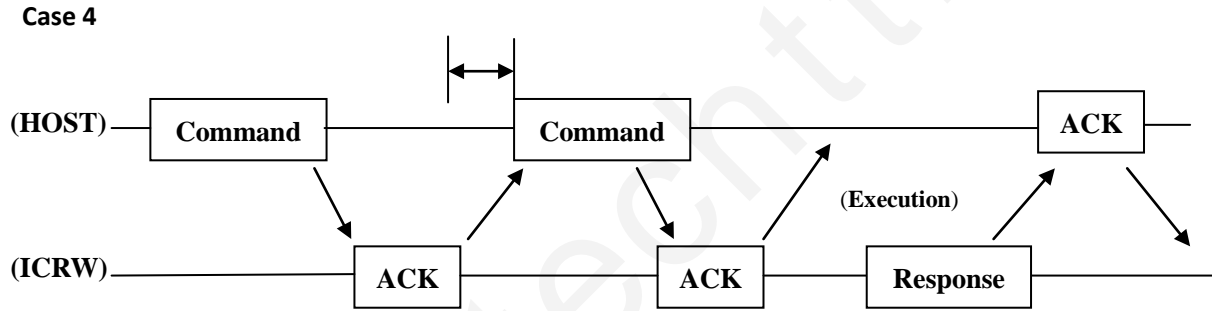
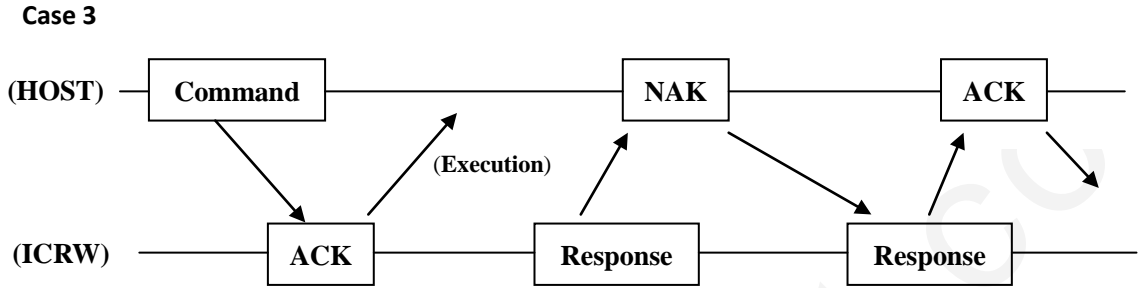
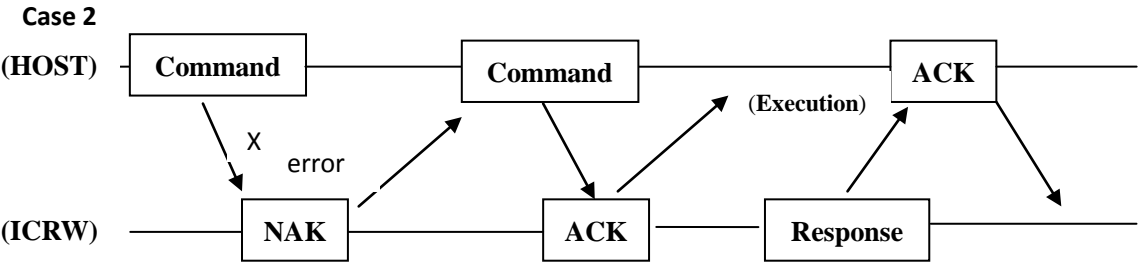
5.1 Correct communication process: (Command and response)



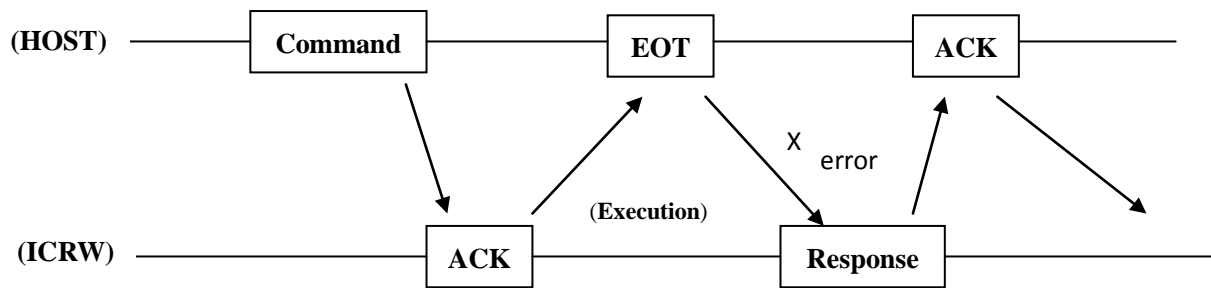
5.2 Incorrect communication process: (Command and response)

Case 1





Case 7



6.Commands sheet

| Chapter | Command | Function | CM | PM | Description |
|---------|-----------------------------------|---|-----|-----|--|
| 9.1 | Machine reposition | Execute initialize: with card inside, move card to a certain position; without card, execute inspect motion and return software version | 30H | 30H | Reposition and move card to port(hold) |
| | | | | 31H | Reposition and collect card in to collect bin |
| | | | | 33H | Reposition but don't move card |
| | | | | 34H | Same as 30H and start up take count of collect card function |
| | | | | 35H | Same as 31H and start up take count of collect card function |
| | | | | 37H | Same as 33H and start up take count of collect card function |
| 9.2 | Read version info | | DCH | 31H | Machine version information |
| 9.3 | Check status | Check machine present status | 31H | 30H | Check machine present basic status |
| | | | | 31H | Check machine present basic status (Se status) |
| 9.4 | Move card | Move the card in side machine to a certain position | 32H | 30H | Move card to port(hold) |
| | | | | 31H | Move card to IC card read/write position |
| | | | | 32H | Move card to RF card read/write position |
| | | | | 33H | Collect card into collect bin |
| | | | | 39H | Move card to port (drop) |
| 9.5 | Setting card in and out from port | | 33H | 30H | Allow card in from port |
| | | | | 31H | Forbid card in from port |
| 9.6 | Machine configure information | | A3H | 30H | To get machine configure information |

7. Status code (st0,st1,st2) and its signification

| st0 | Signification |
|-----|---|
| "0" | No card in machine channels |
| "1" | One card in the channels come out port |
| "2" | There is card in the RC/IC card read/write position |

| st1 | Signification |
|-----|------------------------------------|
| "0" | Dispense card bin no card |
| "1" | Dispense card bin card less |
| "2" | Dispense card bin have enough card |

| st2 | Signification |
|-----|-------------------------------|
| "0" | Collect card bin haven't full |
| "1" | Collect card bin is full |

8. e1,e0 Error character code sheet:

| e1,e0 | Signification |
|-------|--------------------------------------|
| "00" | No define |
| "01" | Command parameter error |
| "02" | Command execute sequence error |
| "03" | Hardware no support command |
| "10" | Card jam or command execute overtime |
| "A0" | Dispense card bin empty, no card |
| "A1" | Collect card bin was full |

9. Commands instructions

9.1 Reset (initialization)

HOST command (TXET):

| | | |
|-----|-----|----|
| "C" | 30H | Pm |
|-----|-----|----|

Correct Return(TXET):

| | | | | | | |
|-----|-----|----|-----|-----|-----|----------|
| "P" | 30H | Pm | st0 | st1 | st2 | Rev_type |
|-----|-----|----|-----|-----|-----|----------|

Incorrect Return(TEXT):

| | | | | |
|-----|-----|----|----|----|
| "N" | 30H | Pm | e1 | e0 |
|-----|-----|----|----|----|

This is the first command when power on, otherwise other command can not be executed. After then, it can be execute times after times depend on your application. When this command first time executed, ICRW automatic inspect HOST communicate baud rate, and communicate by that baud rate. Once this command was execute, All of forestall error code will be deleted, Machine is in the forbid card in from port status and return machine software

version information.

Pm: Machine reposition parameter, without card inside machine, motor will little move (settle those card in the dispense card bin), with card inside machine, there are motions as following:

- =30H Move card to port(hold)
- =31H Collect card into collect bin
- =33H Don't move card
- =34H Same asPm=30H, and start up take count of collect card
- =35H Same asPm=31H, and start up take count of collect card
- =37H Same asPm=33H, and start up take count of collect card

Rev_type: Machine software version information, "CRT_571_V1.0".

9.2 Check status

HOST command

| | | |
|-----|-----|----|
| "C" | 31H | Pm |
|-----|-----|----|

Correct Return:

| | | | | | | | | |
|-----|-----|----|-----|-----|-----|---|-----------------|---|
| "P" | 31H | Pm | st0 | st1 | st2 | ⋮ | Sensor(10 byte) | ⋮ |
|-----|-----|----|-----|-----|-----|---|-----------------|---|

Incorrect Return:

| | | | | |
|-----|-----|----|----|----|
| "N" | 31H | Pm | e1 | e0 |
|-----|-----|----|----|----|

Pm=30H Return if there is card in machine **st0, st1, st2** (See 7. Status code)

Pm=31H Return if there is card in machine, and all detect sensor(10byte) status info, see following sheet:

| Sensor | status |
|------------------------|---------------|
| S1 | 30H No card |
| | 31H Have card |
| S2 | 30H No card |
| | 31H Have card |
| S3 | 30H No card |
| | 31H Have card |
| S4 | 30H No card |
| | 31H Have card |
| S5 (System preserving) | |
| | |
| S6 | 30H No card |
| | 31H Have card |
| S7 | 30H No card |
| | 31H Have card |
| S8 | 30H No card |
| | 31H Have card |
| S9 | 30H No card |
| | 31H Have card |

| | |
|------------|----------------------|
| S10 | 30H No card |
| | 31H Have card |

KS1 30H, No card;
31H Have card;
KS2 30H No card;
31H Have card;

9.3 Moving card:

HOST command

| | | |
|------------|------------|-----------|
| "C" | 32H | Pm |
|------------|------------|-----------|

Correct Return

| | | | | | |
|------------|------------|-----------|------------|------------|------------|
| "p" | 32H | Pm | st0 | st1 | st2 |
|------------|------------|-----------|------------|------------|------------|

Incorrect Return

| | | | | |
|------------|------------|-----------|-----------|-----------|
| "N" | 32H | Pm | e1 | e0 |
|------------|------------|-----------|-----------|-----------|

Pm=30H Move card to port(hold)

Pm=31H Move card to IC card read/write position (only for cards from dispense bin)

Pm=32H Move card to RF card read/write position

Pm=33H Collect card into collect bin

Pm=39H Move card to port (drop)

When process moving card motion and card can not in the assign position, machine will return card jam error.

Remark: When process collecting card, collect card bin was full, machine will return " collect card bin full error", at this case, please take off cards which in the collect card bin.

9.4 Enable/Disable card in from port:

HOST command

| | | |
|------------|------------|-----------|
| "C" | 33H | Pm |
|------------|------------|-----------|

Correct Return

| | | | | | |
|------------|------------|-----------|------------|------------|------------|
| "p" | 33H | Pm | st0 | st1 | st2 |
|------------|------------|-----------|------------|------------|------------|

Incorrect Return

| | | | | |
|------------|------------|-----------|-----------|-----------|
| "N" | 33H | Pm | e1 | e0 |
|------------|------------|-----------|-----------|-----------|

Setting enable / disable card in from port. Enable: when there is card in, card will be move to RF read/write position, Also can use check status command to make card in finished.

Pm=30H Allow card in from port

Pm=31H Forbid card in from port

F3 RFID Reader/writer module communication

9.5.2 Automatic checking RF card type:

HOST Command:

| | | |
|-----|-----|-----|
| "C" | 50H | 31H |
|-----|-----|-----|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-----------|
| "P" | 50H | 31H | St0 | St1 | St2 | Card_type |
|-----|-----|-----|-----|-----|-----|-----------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 50H | 31H | e1 | e0 |
|-----|-----|-----|----|----|

Automatic checking current RF type, drive card to RF card position, automatic checking current RF card type, finish checking, return Card_type info.

| Card_type (2 byte) | | Explain |
|--------------------|-----|---------------------|
| '0' | '0' | Unknow card type |
| '1' | '0' | Mifare one S50 card |
| | '1' | Mifare one S70 card |
| | '2' | Mifare one UL card |
| '2' | '0' | Type A CPU card |
| '3' | '0' | Type B CPU card |

9.10 Contactless IC card operation:

9.10.1 Reset and activation:

HOST Command

| | | | | |
|-----|-----|-----|------|------|
| "C" | 60H | 30H | Set1 | Set2 |
|-----|-----|-----|------|------|

(1) Mafare one card success return:

| | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|------|---------|----------|-----|
| "P" | 60H | 30H | st0 | st1 | st2 | Rtype | ATQA | UID_len | UID-data | SAK |
|-----|-----|-----|-----|-----|-----|-------|------|---------|----------|-----|

Mafare one card fail return:

| | | | | | | | | | |
|-----|-----|-----|----|----|-------|------|---------|----------|-----|
| "N" | 60H | 30H | e1 | e0 | Rtype | ATQA | UID_len | UID_data | SAK |
|-----|-----|-----|----|----|-------|------|---------|----------|-----|

(2) 14443 type A card success return:

| | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|------|---------|----------|-----|-----|
| "P" | 60H | 30H | st0 | st1 | st2 | Rtype | ATQA | UID_len | UID-data | SAK | ATS |
|-----|-----|-----|-----|-----|-----|-------|------|---------|----------|-----|-----|

14443 type A card fail return:

| | | | | | | | | | | |
|-----|-----|-----|----|----|-------|------|---------|----------|-----|-----|
| "N" | 60H | 30H | e1 | e0 | Rtype | ATQA | UID_len | UID_data | SAK | ATS |
|-----|-----|-----|----|----|-------|------|---------|----------|-----|-----|

(3) 14443 type B card success return:

| | | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|------|
| "P" | 60H | 30H | st0 | st1 | st2 | Rtype | ATQB |
|-----|-----|-----|-----|-----|-----|-------|------|

14443 type b card fail return:

| | | | | | | |
|-----|-----|-----|----|----|-------|------|
| "N" | 60H | 30H | e1 | e0 | Rtype | ATQB |
|-----|-----|-----|----|----|-------|------|

Reset RFID card and activation.

Support IEC/ISO14443 Type A and IEC/ISO 14443 Type B reset and activation.

Process flow as:

1).Mifare one card:

1. Request A(REQ A) / Answer Request A (ATQ A).
2. Anticollision
3. Select(SEL) / Unique Identifier(UID) & Select Acknowledge(SAK)

After Mifare card activated, machine return::

Request responson ATQA(2 byte), card series number UID_data (4—10 byte) and select card responson SAK(1 byte).

2).ISO/IEC 14443 Type A:

1. Request A(REQ A) / Answer Request A (ATQ A).
2. Anticollision
3. Select(SEL) / Unique Identifier(UID) & Select Acknowledge(SAK)
4. Request for answer to select (RATS) / Answer to Select(ATS)
5. Protcol and parameter selection request(PPSR) / PPS start(PPSS)

After ISO/IEC 14443 Type A card activated success, machine return:

In Mifare card return value adding request responson ATS(1-254 byte) and protocol parameter selection(1 byte).

3).ISO/IEC 14443 Type B:

1. Request B(REQ B) / Answer Request B (ATQ B).
2. Attribute(A TTRIB) / Answer to ATTRIB

After ISO/IEC 14443 Type B card activated success, machine return ATQB 12 byte (include following info):

50H, PUI(4 byte) , App.data(4 byte), Protoclol info(3 byte)

Thereinto:

Set1,Set2 setting different protocol RFID card reset activation operation rank.

Valid value: 41H ('A' = Type A), 42H('B' = Type B), 30H('0' = No use)

Ex1: Set1= 'A', Set2 = 'B' (default)

Means reset activation operate rank is: Type A is first rank, and Type B is second rank.

Ex2: Set1= 'B', Set2 = 'A'

Means reset activation operate rank is: Type B is first rank, and Type A is second rank.

Ex3: Set1= 'A', Set2 = '0'

Means reset activation operate rank is: Type A is first rank, and Type B don't activation.

Ex4: Set1= 'B', Set2 = '0',

Means reset activation operate rank is: Type B is first rank, and Type A don't activation.

Rtype: Current activated card protocol.

= 41H ('A') Card meet ISO/IEC 14443 Type A Protocol.

= 42H ('B') Card meet ISO/IEC 14443 Type B protocol.

= 4DH ('M') Card meet Philips Mifare one card protocol.

When Rtype=4DH('M'):

ATQA= 0044H card is Mifare Ultralight Card

ATQA= 0004H card is Mifare S50 1K Card

ATQA= 0002H card is Mifare S70 4K Card

Mifare one, ISO/IEC 14443 Type A card return UID_len assign return card series number UID_data info length.

UID_len=4 Means return card series number UID_data info length is 4 byte

UID_len=7 Means return card series number UID_data info length is 7 byte

UID_len=10 Means return card series number UID_data info length is 10 byte

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9.10.2 RIFD card off power released:

HOST Command:

| | | |
|-----|-----|-----|
| "C" | 60H | 31H |
|-----|-----|-----|

Success return:

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| "P" | 60H | 31H | st0 | st1 | st2 |
|-----|-----|-----|-----|-----|-----|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 31H | e1 | e0 |
|-----|-----|-----|----|----|

RFID card off power release, RF module shut down output signal to antenna.

9.10.3 RFID card check status:

HOST Command:

| | | |
|-----|-----|-----|
| "C" | 60H | 32H |
|-----|-----|-----|

Success return:

| | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|
| "P" | 60H | 32H | st0 | st1 | st2 | Sti | stj |
|-----|-----|-----|-----|-----|-----|-----|-----|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 32H | e1 | e0 |
|-----|-----|-----|----|----|

Checking current RFID card status sti,stj:

| sti | stj | Explain |
|-----|-----|------------------------|
| '0' | '0' | No RFID card activated |
| '1' | '0' | Mifare one S50 card |
| | '1' | Mifare one S70 card |
| | '2' | Mifare one UL card |
| '2' | '0' | Type A CPU card |
| '3' | '0' | Type B CPU card |

9.10.4 Mifare 1 card operation:

To Mifare 1 card (read/write etc) operate, the use command data is similar to ISO/IEC 7816 T=0 standard data exchange command(C-APDU) format to operate. So, after machine receive an assign signification command data, it start the related operation. When command executed success, return data package add 9000H; When command executed fail, return only that similar ISO/IEC 7816-3 T=0 standard's " sw1 + sw2" this 2 error code.

| Sw1 | Sw2 | Explain |
|-----|-----|--------------------------|
| 90H | 00H | Operate success |
| 6FH | 00H | Operate fail |
| 6BH | 00H | Operate address overflow |
| 67H | 00H | Operate length overflow. |

9.10.4.1 Verify pass word.

HOST Command:

| | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|-------|
| "C" | 60H | 33H | 00H | 20H | ks | sn | 1c | pdata |
|-----|-----|-----|-----|-----|----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

Download pass word in machine and verify assign sector pass word directly.

ks(1byte): key select Pass word type character selection (Key A=00H, Key B=01H)

sn(1byte): sector number sector number (S50 card sn=00H-0FH, S70 card sn=00H-27H)

lc(1byte): pass word data length lc=06H

pdata(6 byte): password data pass word data

rdata(2 byte): return data, success return 9000, fail return sw1+sw2(2 byte).

9.10.4.2 From EEPROM loading pass word verify.

HOST Command:

| | | | | | | |
|-----|-----|-----|-----|-----|----|----|
| "C" | 60H | 33H | 00H | 21H | ks | sn |
|-----|-----|-----|-----|-----|----|----|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

Read the saved pass word in the machine EEPROM to verify the assign sector's pass word, use 9.10.4.4 command preview download pass word to machine EEPROM, this EEPROM can save 32 group pass word data.

ks(1byte): key select, pass word type character select (Key A=00H, Key B=01H)

sn(1byte): sector number (sn=00H-0FH)

rdata(2 byte): return data , success return 9000H

9.10.4.3 Change Sector pass word.(KEY A):

HOST Command:

| | | | | | | | | |
|-----|-----|-----|-----|-----|-----|----|----|-------|
| "C" | 60H | 33H | 00H | D5H | 00H | sn | 1c | pdata |
|-----|-----|-----|-----|-----|-----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | St0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e2 |
|-----|-----|-----|----|----|

Revise Sector pass word KEYA:

To execute this command can change KEY A pass word operate only, and KEYB pass word change to:

"0xFF, 0xFF, 0xFF,0xFF,0xFF,0xFF" in the mean while, control character write as: "0xFF, 0x07, 0x80, 0x69" (card default setting).

Need to change KEY A , KEY B 's character, use write block command to operate it..

sn(1byte): sector number (S50 card sn=00H-0FH, S70 card sn=00H-27H)

lc(1byte): pass word data length lc=06H

pdata : password data new pass word data 6 byte.

rdata(2 byte): return data success return: 9000.Fail return sw1+sw2(2 byte).

9.10.4.4 Download pass word to EEPROM:

HOST Command:

| | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|-------|
| "C" | 60H | 33H | 00H | D0H | ks | sn | 1c | pdata |
|-----|-----|-----|-----|-----|----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | Rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

Download pass to RF EEPROM for loading verify sector pass word directly. RF EEPROM can save 32 group pass word data.

ks(1byte): key select Password type character select (Key A=00H, Key B=01H)

sn (1byte): sector number (sn=00H-0FH)

lc(1byte): Pass word data length lc=06H

pdata(6 byte): password data

rdata(2 byte): return data

Operate success return: sw1+sw2=9000H.

Operate fail return: sw1+sw2=6F00H

9.10.4.4 Read sector block data:

HOST Command:

| | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|
| "C" | 60H | 33H | 00H | B0H | sn | bn | le |
|-----|-----|-----|-----|-----|----|----|----|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

Read a block data from RF card sector or continuumread muti data block.

sn(1 byte): sector number , operate sector number

bn(1 byte): block number , operate bigninning block number

le(1 byte): block number, opertae block length (le=01H read a block data of sector, le=03H , read 3 block data of sector)

rdata(2 byte): return data, success return reading block data +9000H. Fail return only: sw1+sw2(2 byte).

Note:

- 1.Ultralight Card have one block in every setcor only, every block have 4byte data. S50,S70 card every block have 16 byte data.
- 2.Ultralight Card,Mifare 1k(S50), Mifare 1k (S70) card operation sector number, operation beginning block number, operation block length value can not over the card capacity:

Ultralight Card: sn=00H-0FH, bn=00H, le=01H-0FH

Mifare 1k(S50): sn=00H-0FH, bn=00H-03H, le=01H-04H

Mifare 1k(S70): sn=00H-20H, bn=00H-03H, le=01H-04H

sn=21H-27H, bn=00H-0FH, le=01H-10H(S70 card in the last 8 sector, every sector have 16 block)

9.10.4.5 Write sector block data:

HOST Command:

| | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|-------|
| "C" | 60H | 33H | 00H | D1H | sn | bn | lc | wdata |
|-----|-----|-----|-----|-----|----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

Write one block data to RF card sector or contunuum write multi-block data to RF card sector.

sn(1 byte): sector number , operate sector number

bn(1 byte): block number , operate beginning block number

le(1 byte): block number, operate block length

wdata: block data which want to write(n byte)

rdata(2 byte): return data , success return reading block data+9000H, fail return: sw1+sw2(2 byte).

Note:

1. Ultralight Card have one block in every sector only, every block have 4byte data. S50,S70 card every block have 16 byte data.
2. Ultralight Card, Mifare 1k(S50), Mifare 1k (S70) card operation sector number, operation beginning block number, operation block length value can not over the card capacity:

Ultralight Card: sn=00H-0FH, bn=00H-03H, lc=01H-03H

Mifare 1k(S50): sn=00H-0FH, bn=00H-03H, lc=01H-03H

Mifare 1k(S70): sn=00H-20H, bn=00H-03H, lc=01H-03H

sn=21H-27H, bn=00H-0FH, lc=01H-0FH

(S70 card in the last sector every sector there are 16 blocks)

3. S50,S70 card every sector's last block is the control block of that sector, save Key A password, read/write control character, Key B password.

***When writing multi-block, please don't write this block, and machine also forbid to operate the sector last block when doing continual write multi-block. ***

9.10.4.6 Value initialization operation:

HOST Command:

| | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|-------|
| "C" | 60H | 33H | 00H | D2H | sn | bn | lc | wdata |
|-----|-----|-----|-----|-----|----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

Initialization of sector block value operation.

sn(1 byte): sector number , operate sector number

bn(1 byte): block number , operate beginning block number

lc(1byte): value initialization data length lc=04H

wdata: value initialization data(4 byte)

rdata(2 byte): return data , success return 9000H, fail return sw1+sw2(2 byte).

Note:

Mifare 1k(S50), Mifare 1k (S70) card operate sector number, operate beginning block number cannot over the card capacity, and every sector's last block can not doing value operate.

Mifare 1k(S50): sn=00H-0FH, bn=00H-03H,

Mifare 1k(S70): sn=00H-20H, bn=00H-03H,

sn=20H-27H, bn=00H-0EH,

(S70 card in the last 8 sector every sector there are 16 blocks)

9.10.4.7 Read value:

HOST Command:

| | | | | | | |
|-----|-----|-----|-----|-----|----|----|
| "C" | 60H | 33H | 00H | B1H | sn | bn |
|-----|-----|-----|-----|-----|----|----|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

RF card sector block read value operate.

sn(1 byte): sector number , operate sector number

bn(1 byte): block number , operate beginning block number

rdata: return data , success return reading value data (4 byte)+9000H.

Fail return: sw1+sw2(2 byte).

Note:

Mifare 1k(S50), Mifare 1k (S70) card operate sector number, operate beginning block number cannot over the card capacity, and every sector's last block can not doing value operate.

Mifare 1k(S50): sn=00H-0FH, bn=00H-03H,

Mifare 1k(S70): sn=00H-20H, bn=00H-03H,

sn=20H-27H, bn=00H-0EH,

(S70 card in the last 8 sector every sector there are 16 blocks)

9.10.4.8 Increase value

HOST Command::

| | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|-------|
| "C" | 60H | 33H | 00H | D3H | sn | bn | lc | wdata |
|-----|-----|-----|-----|-----|----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

RF card sector block increase value operate.

sn(1 byte): sector number, operate sector number

bn(1 byte): block number , operate beginning block number

lc(1byte): increase value data length lc=04H

wdata: increase data (4 byte)

rdata: return data , success return 9000H.

Fail return: sw1+sw2(2 byte).

Note:

Mifare 1k(S50), Mifare 1k (S70) card operate sector number, operate beginning block number cannot over the card capacity, and every sector's last block can not doing value operate.

Mifare 1k(S50): sn=00H-0FH, bn=00H-03H,

Mifare 1k(S70): sn=00H-20H, bn=00H-03H,

sn=20H-27H, bn=00H-0EH,

(S70 card in the last 8 sector every sector there are 16 blocks)

9.10.4.9 Decrease value

HOST Command:

| | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|-------|
| "C" | 60H | 33H | 00H | D4H | sn | bn | lc | wdata |
|-----|-----|-----|-----|-----|----|----|----|-------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-------|
| "P" | 60H | 33H | st0 | st1 | st2 | rdata |
|-----|-----|-----|-----|-----|-----|-------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

RF card sector block decrease value operate.

sn(1 byte): sector number operate sector number

bn(1 byte): block number operate beginning block number

lc(1byte): decrease value data length lc=04H

wdata: decrease value data(4 byte)

rdata: return data , success return 9000H.

Fail return: sw1+sw2(2 byte).

Note:

Mifare 1k(S50), Mifare 1k (S70) card operate sector number, operate beginning block number cannot over the card capacity, and every sector's last block can not doing value operate.

Mifare 1k(S50): sn=00H-0FH, bn=00H-03H,

Mifare 1k(S70): sn=00H-20H, bn=00H-03H,

sn=20H-27H, bn=00H-0EH,

(S70 card in the last 8 sector every sector there are 16 blocks)

9.10.5 Type A RF card communication:

HOST Command:

| | | | |
|-----|-----|-----|--------|
| "C" | 60H | 34H | C-APDU |
|-----|-----|-----|--------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|--------|
| "P" | 60H | 34H | st0 | st1 | st2 | R-APDU |
|-----|-----|-----|-----|-----|-----|--------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

This command is based on ISO/IEC 14443-4 rules, execute RF Type A T=CL protocol card doing data exchange operation.

Note: C-APDU package the max length in 261 byte, R-APDU package max length in 258 byte.

9.10.6 Type B Rfcard communication:

HOST Command:

| | | | |
|-----|-----|-----|--------|
| "C" | 60H | 35H | C-APDU |
|-----|-----|-----|--------|

Success return:

| | | | | | | |
|-----|-----|-----|-----|-----|-----|--------|
| "P" | 60H | 35H | st0 | st1 | st2 | R-APDU |
|-----|-----|-----|-----|-----|-----|--------|

Fail return:

| | | | | |
|-----|-----|-----|----|----|
| "N" | 60H | 33H | e1 | e0 |
|-----|-----|-----|----|----|

This command is based on ISO/IEC 14443-4 rules, excute RF Type B T=CL protocol card doing data exchange operation.

Note: C-APDU package the max length in 261 byte, R-APDU package max length in 258 byte.