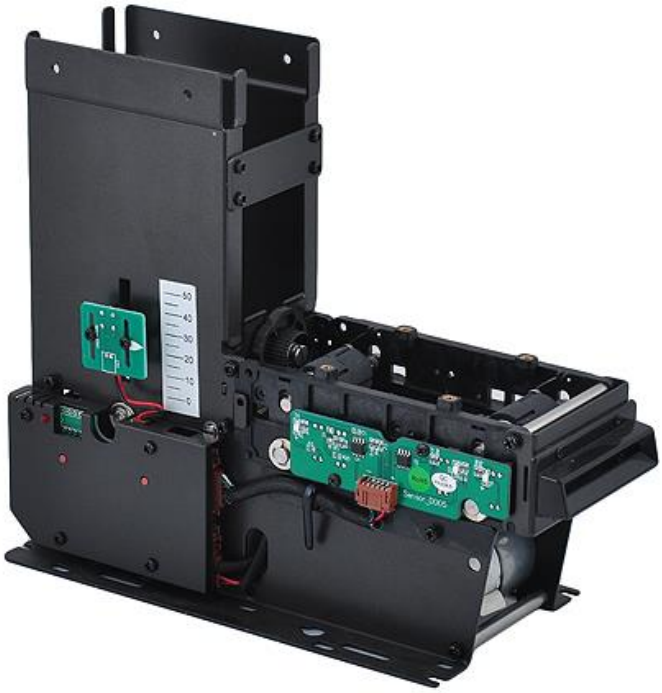
SYNCOTEK
Hardware Solution Provider

Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055

Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

Card Dispenser
SK-AD1-1
Communication Protocol

REV: A 2011-01-01



Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

Contents

Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

1 Communication Format Descriptions

1.1 Communication Character Format

Baud Rate (BPS): 9600/192000/38400/57600BPS (Automatic recognition)
Communication Method: Asynchronous
Transmission Type: Half-duplex, multi communication with max 16 C/Ds.
Data frame Structure:

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

Start Bit: 1 bit
Data Bit: 8 bits
Parity Bit: N/A
Stop Bit: 1 bit
Coding Scheme: ASCII 8-bit encoding

2 Command Structure

Support multi-unit communication (16 units max), Default address is 15#, address 15# is two bytes (0x31 0x35).

2.1 Send Command

<STX> OO OO X <ETX> <BCC>
Command Package
Device address

<STX> : 02 (Hex), Frame start.
'O': A representation of a ASCII character code
'X':A representation of a ASCII character code, Extended command parameters (basic command no).
<ETX> : 03 (Hex), Frame end.
<BCC>: <STX> ⊕ O ⊕ O ⊕ O ⊕ O ⊕ <ETX>，Block Check Character.

Note: BCC= STX ^ Address ^ Command Package ^ ETX (^ is exclusive-OR calculation)

Sample: BCC calculation in AP Command

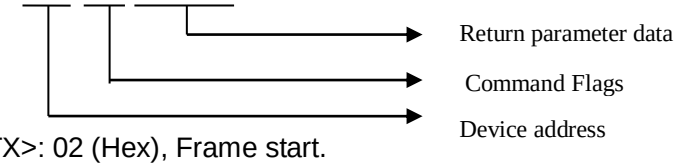
0x02	0x31	0x35	0x41	0x50	0x03	BCC

BCC = 0x02 ^ 0x31 ^ 0x35 ^ 0x41 ^ 0x50 ^ 0x03

Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

2.2 Basic check the status returned data format (RF Command)

<STX> ○○ S F ○○○ <ETX> <BCC>



<STX>: 02 (Hex), Frame start.

'O': A representation of a ASCII character code

<ETX>: 03 (Hex), Frame end.

<BCC>: <STX> ⊕ ○ ⊕ ○ ⊕ 'S' ⊕ 'F' ⊕ ○ ⊕ ○ ⊕ ○ ⊕ <ETX>, Block Check Character.

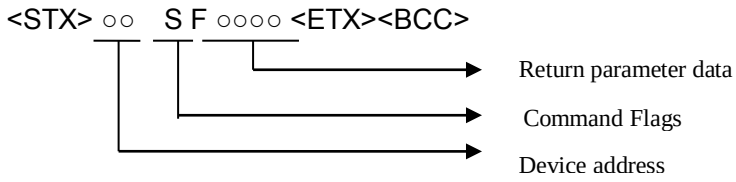
Note: BCC= STX ^ Address ^ 'S' ^ 'F' ^ Parameter Data ^ETX (^ is exclusive-OR calculation)

The meaning of parameter data Flag

HEX	BIN	STATUS
800	1000 0000 0000	Dispensing card
400	0100 0000 0000	Capturing card
200	0010 0000 0000	Dispense error
100	0001 0000 0000	Capture error
080	0000 1000 0000	(Reserved)
040	0000 0100 0000	Card overlapped
020	0000 0010 0000	Card jammed
010	0000 0001 0000	Card Stacker pre-empty
008	0000 0000 1000	Card Stacker empty
004	0000 0000 0100	Sensor 3 status
002	0000 0000 0010	Sensor 2 status
001	0000 0000 0001	Sensor 1 status

Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

2.3 Advanced check the status returned data format (AP Command)



<STX>: 02 (Hex), Frame start.
'O': A representation of a ASCII character code
<ETX>: 03 (Hex), Frame end.

<BCC>: <STX> ⊕ ○ ⊕ ○ ⊕ 'S' ⊕ 'F' ⊕○⊕○⊕○⊕○⊕ <ETX>, Block Check Character.

Note: BCC= STX ^ Address ^ 'S' ^ 'F' ^ Parameter Data ^ETX (^ is exclusive-OR calculation)

The meaning of parameter data Flag

HEX	BIN	STATUS
8000		(Reserved)
4000		(Reserved)
2000	0010 0000 0000 0000	(Reserved)
1000	0001 0000 0000 0000	Capture card-box full
0800	0000 1000 0000 0000	Dispensing card
0400	0000 0100 0000 0000	Capturing card
0200	0000 0010 0000 0000	Dispense error
0100	0000 0001 0000 0000	Capture error
0080	0000 0000 1000 0000	(Reserved)
0040	0000 0000 0100 0000	Card overlapped
0020	0000 0000 0010 0000	Card jammed
0010	0000 0000 0001 0000	Card pre-empty
0008	0000 0000 0000 1000	Card Stacker empty
0004	0000 0000 0000 0100	Sensor 3 status
0002	0000 0000 0000 0010	Sensor 2 status
0001	0000 0000 0000 0001	Sensor 1 status

Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

3 Basic Command

Command	Descriptions	Return information
DC	Move card to front without holding card	<06H>
CP	Capture card	<06H>
RF	Basic check status	Reference: 2.2 (RF check status return)
AP	Advanced check status	Reference: 2.3 (AP check status return)
RS	Reset Machine	<06H>

4 Extended command

Command	Descriptions	Return information
"FC"+ Position	Move Card to the specified position. Position: = 0x30, stop at front without holding card = 0x34, stop at front with holding card = 0x36, read/write/scan card position	< 06H>
"CS"+ Position	Setting communication baud rate Position: = 0x00 1200BPS = 0x01 2400BPS = 0x02 4800BPS = 0x03 9600BPS = 0x04 19200BPS = 0x05 38400BPS	< 06H>
"IN"+ Parameter	Enable/disable allowed to enter the card from the front. Parameter: = 0x30 disable. = 0x31 enable, after card enter and move card to card bin. = 0x32 enable, after card enter and move card to read card position.	< 06H>
"SI"	Get value of the setting enable/disable allowed to enter the card from the front.	SI+ Parameter

Note:

1. "IN" is an EEPROM operation command and its setting effect will not be influenced by operations such as power-on/reset, which means previous setting value is valid when power is on. Default value of factory setting is Enable Card-in and Move Card to Capture-card-box.
2. Operation of status check command of "SI" entry function is similar to "RF" and "AP", which is without parameter itself. Command returns one byte parameter and parameter value is in accordance with "IN" command.

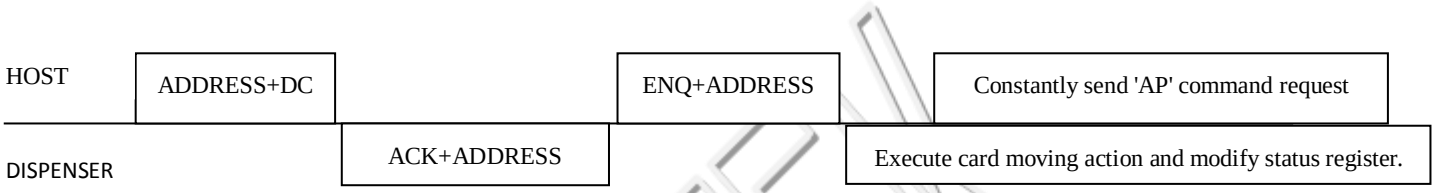
Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

5 Communication Example

5.1 Card Dispense

HOST: <STX> ADDRESS + DC <ETX> <BCC>

DISPENSER: ACK + ADDRESS，Execute card dispensing action and modify status register

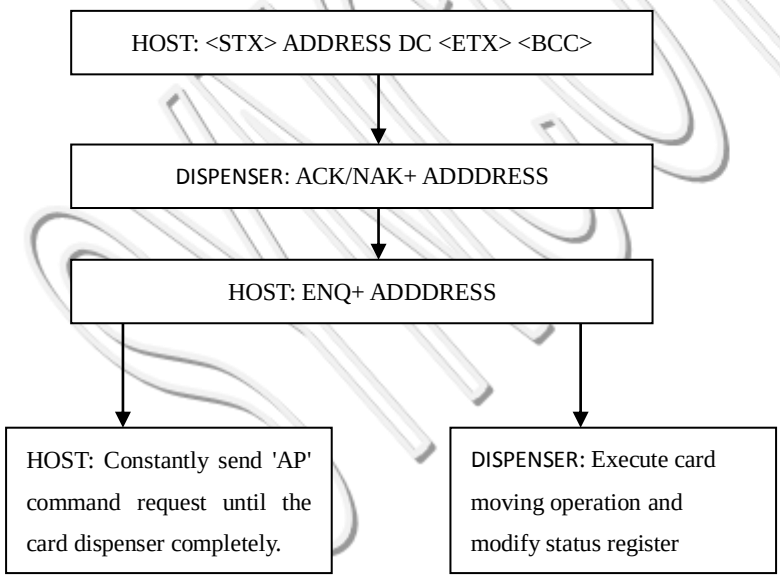


<ACK>: 06H

<NAK>: 15H

<ENQ>: 05H

Card dispense process as in the figure below:

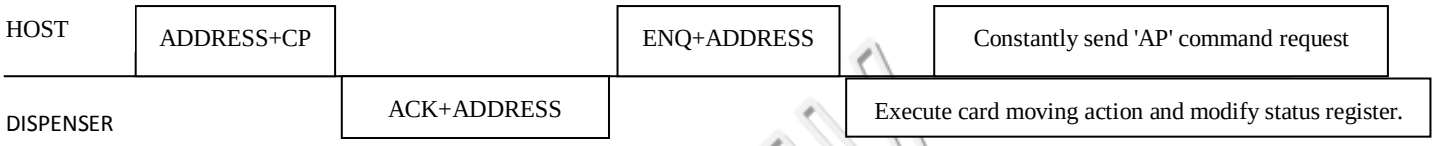


Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

5.2 Card Capture

HOST: <STX> ADDRESS + DC <ETX> <BCC>

DISPENSER: ACK + ADDRESS，Execute card capturing action and modify status register

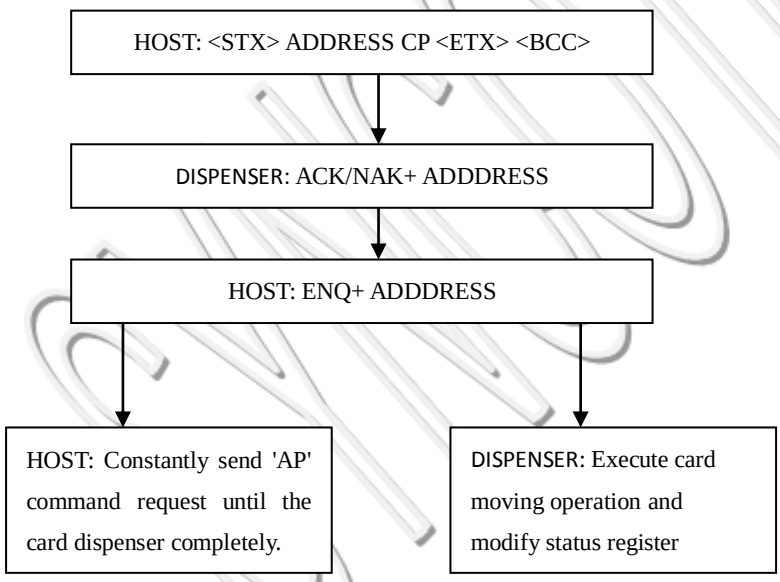


<ACK>: 06H

<NAK>: 15H

<ENQ>: 05H

Card capture process as in the figure below:

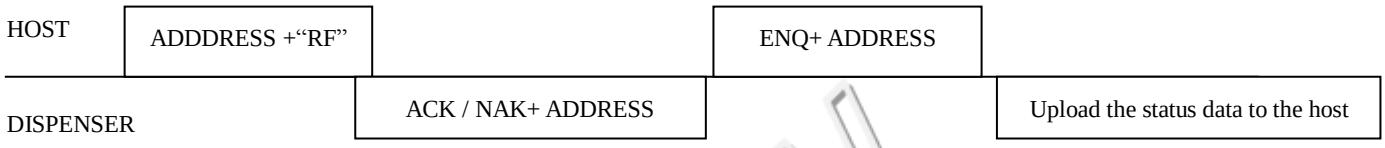


Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

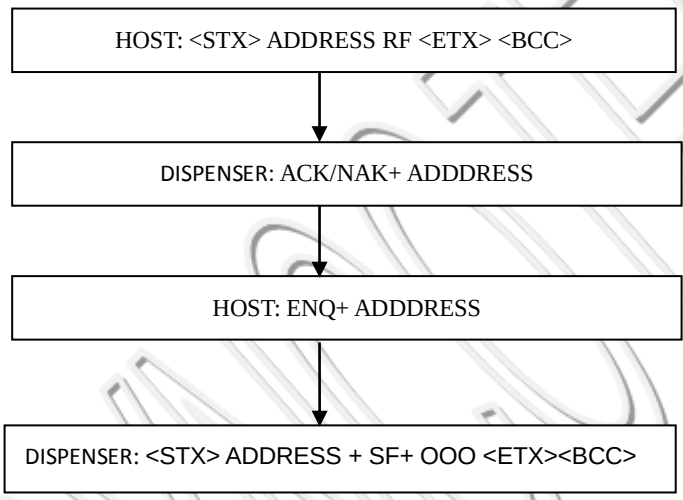
5.3 Basic Check Status

HOST：<STX> ADDRESS RF <ETX> <BCC>

DISPENSER: Send ACK+ ADDRESS, receive ENQ+ ADDRESS, and send <STX> ADDRESS + SF+ OOO <ETX><BCC>



Card capture process as in the figure below:

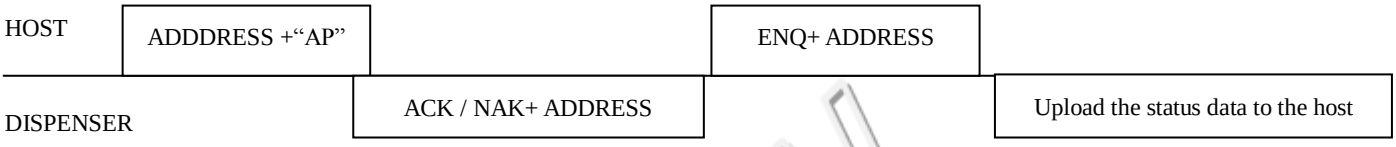


Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

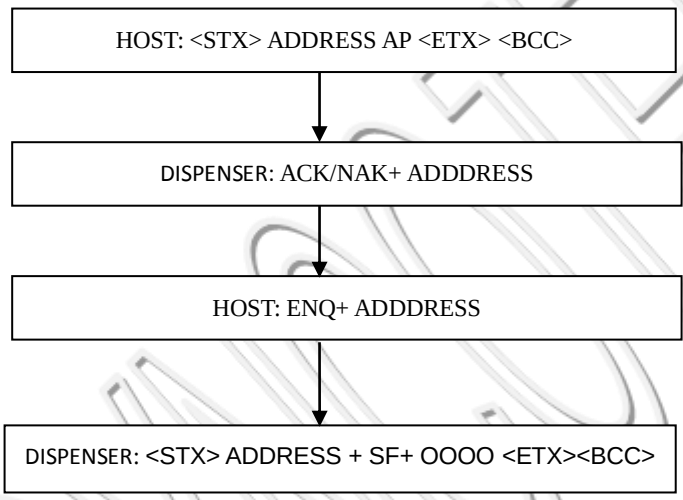
5.4 Advanced Check Status

HOST：<STX> ADDRESS AP <ETX> <BCC>

DISPENSER: Send ACK+ ADDRESS, receive ENQ+ ADDRESS, send <STX> ADDRESS + SF+ OOOO <ETX><BCC>



Card capture process as in the figure below:



Room 716, Yiben E-Commerce
and Industrial Park, Chaguang Road
Nanshan District, Shenzhen, China
Post Code: 518055
Tel: +86-755-82706901
Fax: +86-755-82706900
Email: sales@syncotek.com
Http://www.syncotek.com

6 Switch, Sensor, Card stop position description