

F1-2000 Card Dispenser Communication Protocol

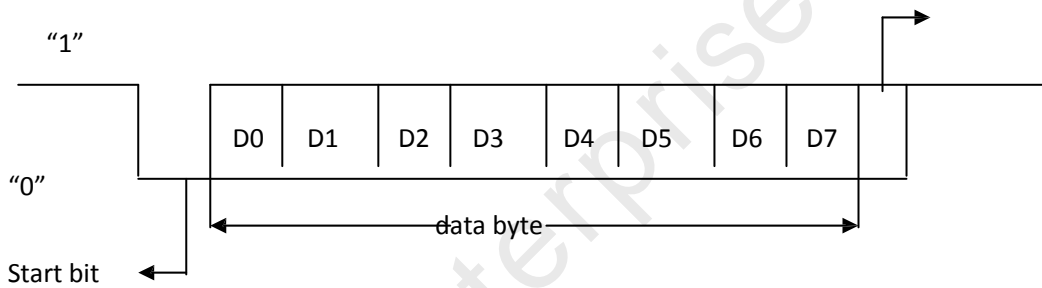
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Multi Machine RS232 communicate mode:

1. Communication Data Format:

Communicate Mode	Asynchronism communication
Start bit	1bit
Data bit	8bits
Parity bit	No
Stop bit	1bit
Default baud rate	9600bps



2 . Communication Control Character

- S T X : 0x02 Data package start character
- E T X : 0x03 Data package end character
- A C K : 0x06 Dispenser affirmative response character
- N A K : 0x15 Dispenser negative response character

3 . Transmit data package structures

3.1 . Data package structure from upper PC(Total in 7 byte)

S T X	Address High byte	Address Low byte	Command high byte	Command Low byte	E T X	B C C
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Explain:

(1) BCC is XOR checksum, Algorithm is as follows:

$$BCC = STX \oplus \text{address high byte} \oplus \text{address low byte} \oplus \text{command high byte} \oplus \text{command low byte} \oplus ETX$$

“^” means XOR.

(2) Data package was sending in ASCII character.

(3) Command please refer to : Command list .

(4) Address valid value only from following list, data belong to character type:

'00'	'01'	'02'	'03'	'04'	'05'	'06'	'07'
'08'	'09'	'10'	'11'	'12'	'13'	'14'	'15'

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3.2 From card dispenser to upper PC data package structure (Response data package, total 7 byte)

S T X	Address High byte	Address Low byte	Working status response byte	Card stacker status response byte	E T X	B C C
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Explain:

- (1) Working status response byte, refer to working status response sheet.
- (2) Card stacker status response byte, refer to Card stacker status response sheet.
- (3) Address valid value only from following list, data belong to character type:

'00'	'01'	'02'	'03'	'04'	'05'	'06'	'07'
'08'	'09'	'10'	'11'	'12'	'13'	'14'	'15'

4 . Command List:

Command name	Code	Function explain
Dispense card , drop out	'D C'(0x44 0x43)	Dispense card out (drop)
Inquiry	'A P'(0x41 0x50)	Check dispenser status
Reset	'RS'(0x52 0x53)	Reset command
Pre-dispense card enabled	'IP' (0x49 0x50)	Pre-dispense card enabled
Pre-dispense card disable	'IE' (0x49 0x45)	Pre-dispense card disable
Setting Baud Rate	'B0'(0x42 0x30)	'B0':1200baud
	'B1'(0x42 0x31)	'B1':2400baud
	'B2'(0x42 0x32)	'B2':4800baud
	'B3'(0x42 0x33)	'B3':9600baud
	'B4'(0x42 0x34)	'B4':19200baud
	'B5'(0x42 0x35)	'B5':38400baud

Explain: Figures in brackets is ASCII character corresponding sixteen value.

5. Working status response sheet:

Status	Code	Explain
Dispenser Ready	'0'(0x30)	When standby, response such code
Dispensing cards	'1'(0x31)	When dispensing card, response such code
Waiting for taken card	'2'	When card was dispenser to port and hold on the card, waiting for taking out, is has such code.
Last dispense success	'3'(0x33)	After dispense card, receive first inquiry command in such code
Dispense card fail	'4'(0x34)	Dispenser has problem, response such code

Dispenser prepare cards	'5'(0x35)	When dispenser is prepare, response such code
Dispense card command can't execute	'6'(0x36)	When no card, fail, waiting for taking card; dispenser receive a new dispense command, it has no action, after receive first inquiry command, response this code.

6. Card stacker status response data sheet:

Status	Code	Explain
With enough cards	'0' (0x30)	Have enough card in the card stacker
With less cards	'1'(0x31)	Have not too much card, need to add more card
Without cards	'2'(0x32)	Have no card in the card stacker

Explain: Figures in brackets is ASCII character corresponding sixteen value.

7. Communicate instruction

(1). When dispenser receive correct data from upper PC, should check address is correct, if correct, dispenser should response affirmative answer: ACK+ADDRESS (ADDRESS is dispenser address, 2 byte); if incorrect, dispenser will not response any data to upper PC. When receive incorrect data package or BBC error, and with the correct address, dispenser must response negative answer: NAK+ADDRESS (ADDRESS is dispenser address, 2 byte), if incorrect, dispenser will not response any data to upper PC.

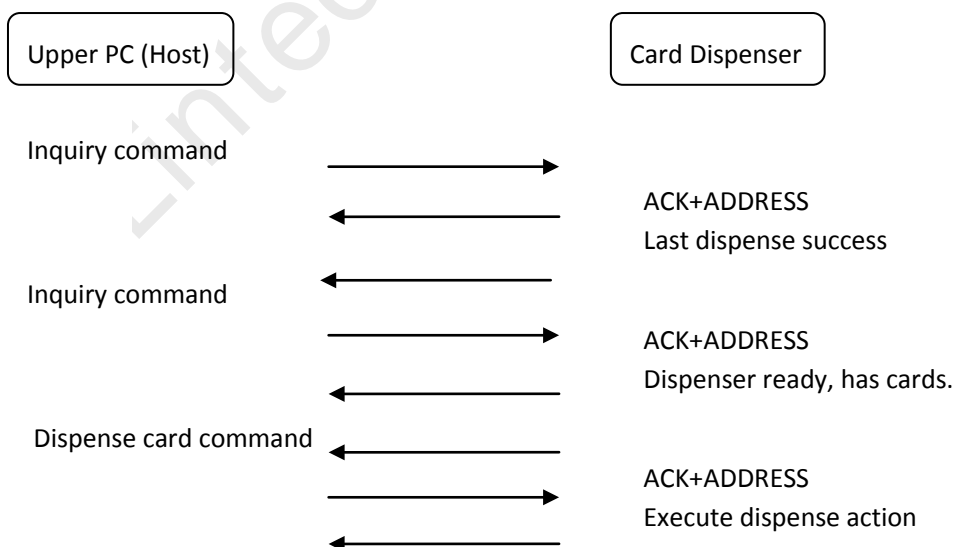
(2) Upper PC receive negative answer, if need to reconnect, must send a new command package. If fail for several times, suggest upper PC trigger alarm, ask for communicate hardware checked.

(3) If upper PC sending address are not from list, there will not any response.

(4) Dispenser is a slave device, no command, no response.

8 .Uper PC and dispenser typical communicate flow (recommended)

8.1 Dispense card flow:

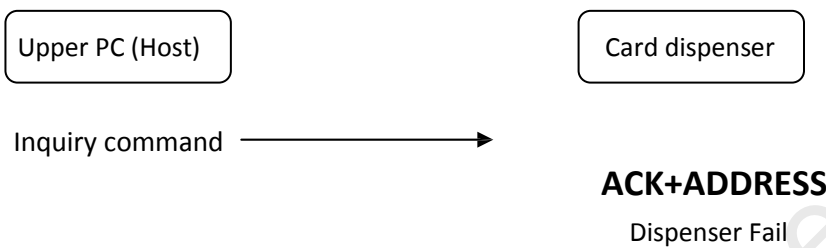


8.2 When dispensing card or preparing dispense card receive dispense card command.



Waiting time suggest at least 200ms,
repeat above flow until appear 8.1 flow.

8.3. When dispenser fail, receive a dispense card command.



Waiting time suggest at least 200ms,
Repeat above flow twice, suggest host
trigger fail alarm.

Explain:

- (1) Host before finished communicate with one dispenser should not communicate with other dispenser.
- (2) ACK+ADDRESS means affirmative response, ADDRESS is card dispenser address, in 2 byte, first high byte then low byte.
- (3) NAK+ADDRESS means negative responses, ADDRESS is card dispenser address, in 2 byte, first high byte then low byte.
- (4) Exmple: No.1 card dispenser affirmative response to host, code as: 0x06 0x30 0x31

9. Card dispenser address setting:

Switch				Address
4	3	2	1	
ON	ON	ON	ON	'00'
ON	ON	ON	OFF	'01'
ON	ON	OFF	ON	'02'
ON	ON	OFF	OFF	'03'
ON	OFF	ON	ON	'04'
ON	OFF	ON	OFF	'05'
ON	OFF	OFF	ON	'06'
ON	OFF	OFF	OFF	'07'

OFF	ON	ON	ON	'08'
OFF	ON	ON	OFF	'09'
OFF	ON	OFF	ON	'10'
OFF	ON	OFF	OFF	'11'
OFF	OFF	ON	ON	'12'
OFF	OFF	ON	OFF	'13'
OFF	OFF	OFF	ON	'14'
OFF	OFF	OFF	OFF	'15'

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10. BBC arithmetic example:

Example1:

Host send inquiry command to dispenser (01 address), Data pack as:

0x02(STX) 0x30(address high byte) 0x31(address low byte) 0x41('A') 0x50('P') 0x03(ETX) 0x11(BBC)
BBC=0x02^0x30^0x31^0x41^0x50^0x03=0x11

Example2:

15 address dispenser send command to Host: Dispenser is waiting for dispense card command, card stacker card enough status data pack as:

0x02(STX) 0x31(address high byte) 0x35(address low byte) 0x30 0x30 0x03(ETX) 0x05(BBC)
BCC=0x02^0x31^0x35^0x30^0x30^0x03=0x05

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