



Ingeniería Electrónica
SMART IDENT

CARD DISPENSER WITH SECURITY CARTRIDGE HAVING ITS OWN ID

User Manual

KSC-2300 Rev. A

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KSC-2100 Card Dispenser
With Security Cartridge having its own ID

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1. Features

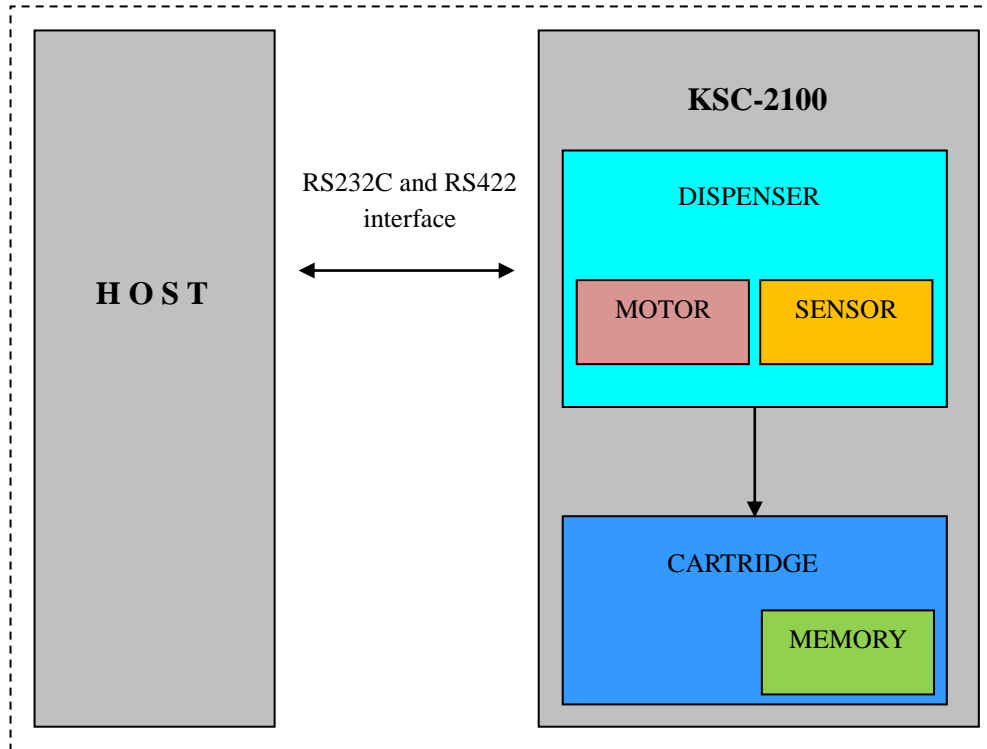
- Max 500 cards capacity with 0.76 mm thickness.
- Adjustable card thickness is from 0.7 mm to 1.0 mm.
- Dispensable card thickness can be adjusted easily.
- RS-232C and RS-422 interface.
- Locking mechanism to completely seal the cartridge.
- Mechanical locking the cartridge with the dispenser.
- Memory in each cartridge for the secure operation.
 - Serial number of the cartridge.
 - Quantity of the cards stacked in the cartridge.

2. Application

- Prepaid card vending machine
- ID card issuing machine
- Parking card vending machine
- Payphone card vending machine
- Automatic card issuing machine
- Ticketing vending machine
- And more

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3. System Block Diagram



4. Environmental Requirements

4.1 Operating Temperature and Humidity : 0~40°C, 0~95% RH

4.2 Conservation Temperature and Humidity : -20~70°C, 0~95% RH

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5. Specifications.

5.1. Model.

| | |
|----------------------------|--|
| MODEL | KSC-2100 |
| Dimension | Refer to page 10 |
| Card Dispensing Time (Sec) | 1.2 |
| Max. Card Loading Capacity | 500 cards with 0.76 mm thickness |
| Total Weight (Kg) | 4.3 kg (for 500 cards) |
| Applicable Cards | Phone Card, Credit, Debit, Pre_padi, I.C Card, RF Card, Parking Card |
| Card Material | P.V.C, A.B.S, P.E.T, Etc. |
| Card Dimension | ISO 7810 |
| Card Thickness | 0.7 ~ 1.0 mm |

5.2. Power Consumption

5.2.1. DC Motor Driver : Output Current 1.5A Per Channel..

5.2.2. Solenoid Driver : Output Current 0.8A Per Channel.

5.2.3. Input voltage : DC 24V Only (DC $\pm 5\%$, Min 2.5A) .

5.2.4. Stand By : 44 mA(+5%) .

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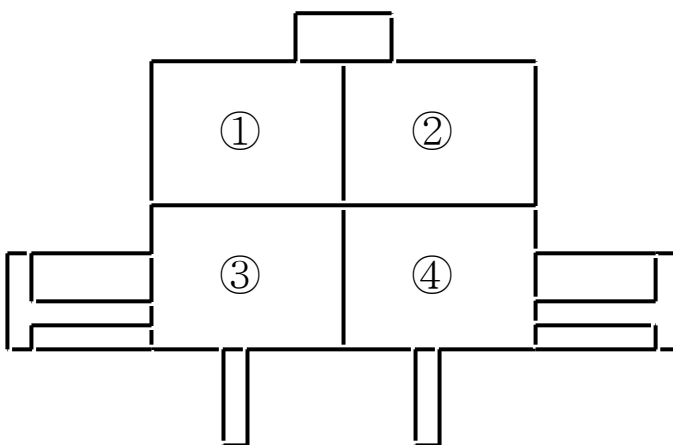
6. DC Power Connector

6.1. Part Number : 5569-04A2 (MOLEX)

6.2. Power Connector Pin Table (PCB side).

- Connector number : J3

Front View (male)



| Pin NO | Signal Name | Direction |
|--------|-------------|-----------|
| 1 | DC +24V | Input |
| 3 | GND | |

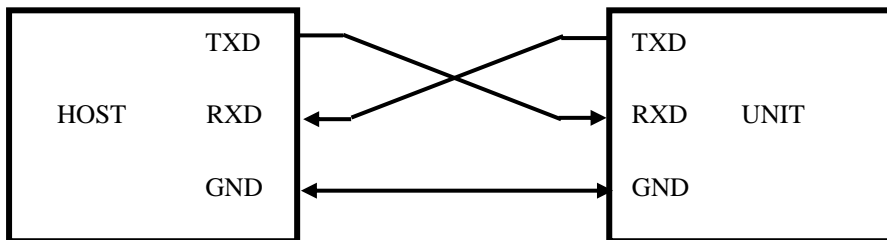
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7. Interface

7.1. RS232C Type.

Part Number : 53015-0310(Molex) , Connector number : J1

. Connect Pin Table(PCB side)



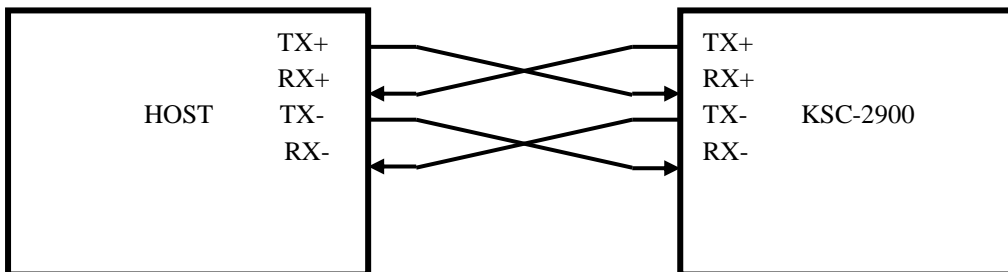
| Pin No | Index | Remark |
|--------|-------|----------|
| 1 | TXD | Transmit |
| 2 | RXD | Receive |
| 3 | GND | S.G |

. Communication Method

- Asynchronous, Half duplex.
- Baud Rate : 9600, 19200BPS (Default : 9600BPS)
- Data Length : 8Bits
- Parity : None
- Stop Bit : 1Bit

| | | | | |
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7.2. RS422 Type.

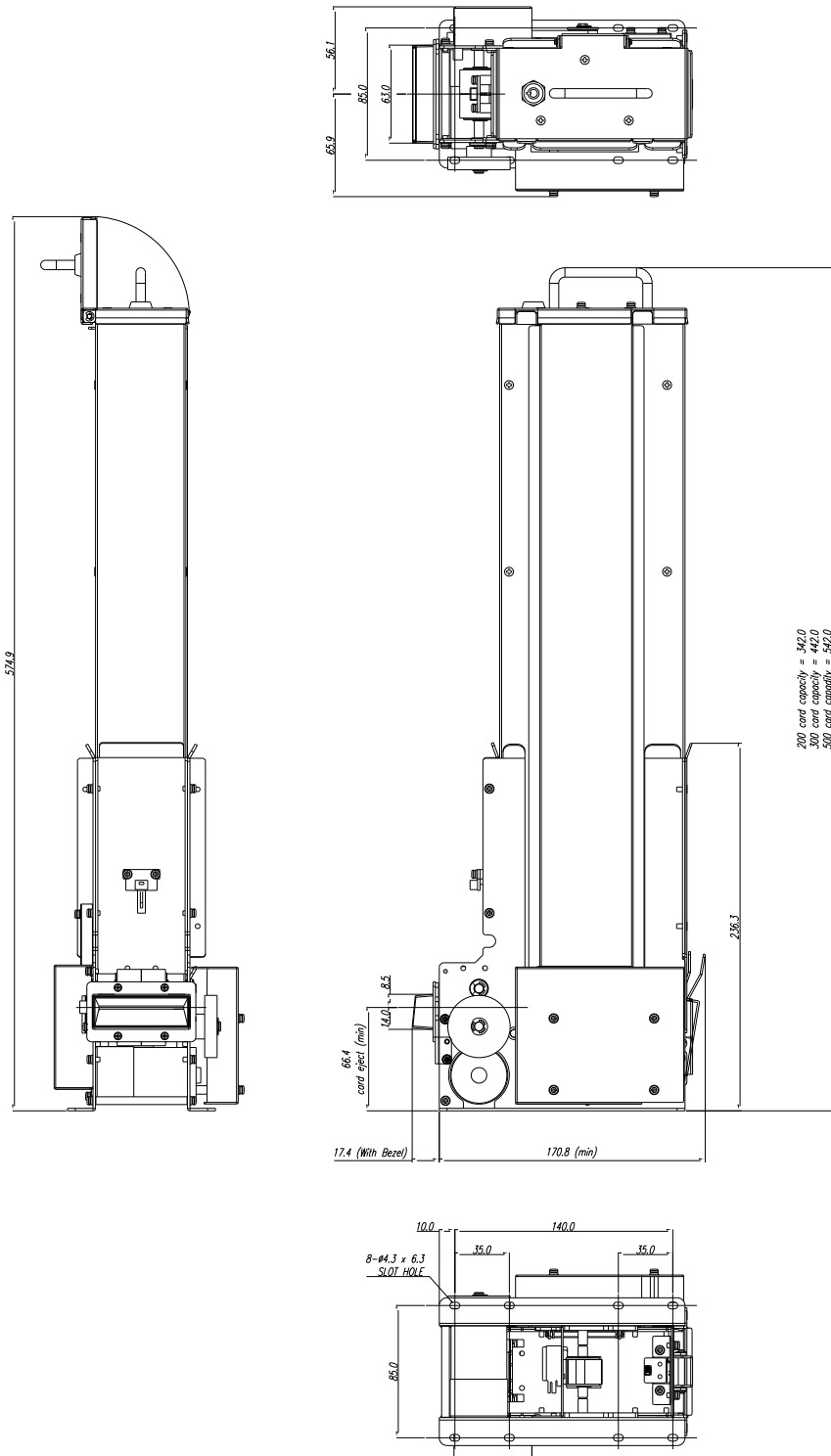


CASE 1) Part Number : D-SUB CONNECTOR(FEMALE), Connector number : P1

| Pin No | INDEX | Remark |
|--------|-------|--------|
| 1 | TX+- | |
| 4 | RX+ | |
| 6 | TX- | |
| 8 | RX- | |

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8. Technical Drawing



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9. RS232C & RS422 Interface

9.1. Control Characters

| NANE | Hex Value | Description |
|------|-----------|----------------------|
| STX | 02 | Start of Text |
| ETX | 03 | End of Text |
| EOT | 04 | End of Transmission |
| ENQ | 05 | Enquiry |
| ACK | 06 | Positive Acknowledge |
| NAK | 15 | Negative Acknowledge |
| CAN | 18 | Cancel |

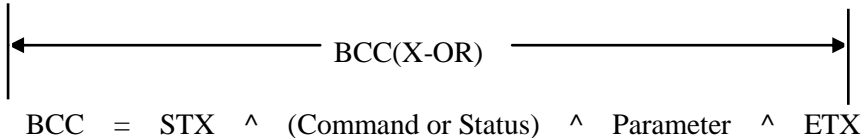
9.2. Frame Format

Command structure

| | | | | |
|-----|---------------------|-----------------------------|-----|-----------------|
| STX | Command (1 Byte) | Parameter (5 Bytes, RFU) | ETX | BCC (1 Byte) |
|-----|---------------------|-----------------------------|-----|-----------------|

Response structure

| | | | | |
|-----|--------------------|-----------------------------|-----|-----------------|
| STX | Status (1 Byte) | Parameter (4 Bytes, RFU) | ETX | BCC (1 Byte) |
|-----|--------------------|-----------------------------|-----|-----------------|



※ RFU: Reserved for future use. And it is filled with 0x80.

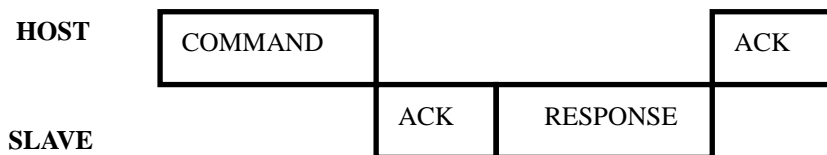
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9.3. Communication Protocol Sequence

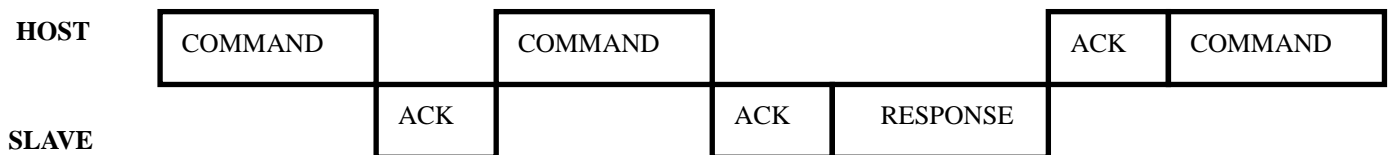
CASE 1)



CASE 2) Request Command (0x31)



CASE 2-1)

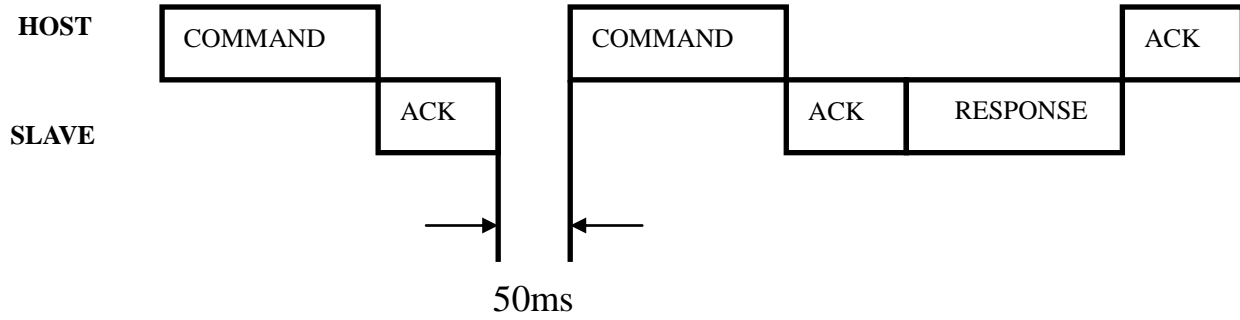


CASE 2-2)



| | | | | |
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CASE 2-3)



cf) To change Baud Rate , send command 50mS after receiving ACK .

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10. Commands

10.1. Command Sets List

| | Command | Description | Note |
|---------------------|---------|-----------------------|---------|
| Clear | 0x30 | Error Clear | |
| Request | 0x31 | Status Request | |
| Issue | 0x40 | Issue | |
| Version | 0x60 | Rom Version | |
| Baud Rate Set | 0x50 | 9600 BPS Setting | Default |
| | 0x51 | 19200 BPS Setting | |
| Cartridge Memory | 0xA6 | Cartridge ID Write | |
| | 0x90 | Cartridge ID Read | |
| | 0xAA | Write Number of Cards | |
| | 0x96 | Read Number of Cards | |

| | | | | |
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10.2. Command Details

10.2.1. Clear

: Clear Motor Jam bit of Status Byte in the Status Request's Response as below.

※ Command Packet

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x30) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

10.2.2. Status Request.

: Request the status of dispenser

Command Packet

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x30) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

※ Response Packet

| | | | | |
|-----|--------------------|-----------------------------|-----|-----|
| STX | Status (1 Byte) | Parameter (4 Bytes, RFU) | ETX | BCC |
|-----|--------------------|-----------------------------|-----|-----|

※ Status Byte Format – Cf) Page 11

| | | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

b7: Always 1.

b6: 1- Busy(Inhibit),
0- Ready.

b5: 1- Cartridge Memory Fail,
0- Cartridge Memory Good,

b4: 1- Motor Fail or Card Jam,
0- Motor Good.

b3: 1- Cartridge Sensor is detected,
0- Cartridge Sensor is not detected

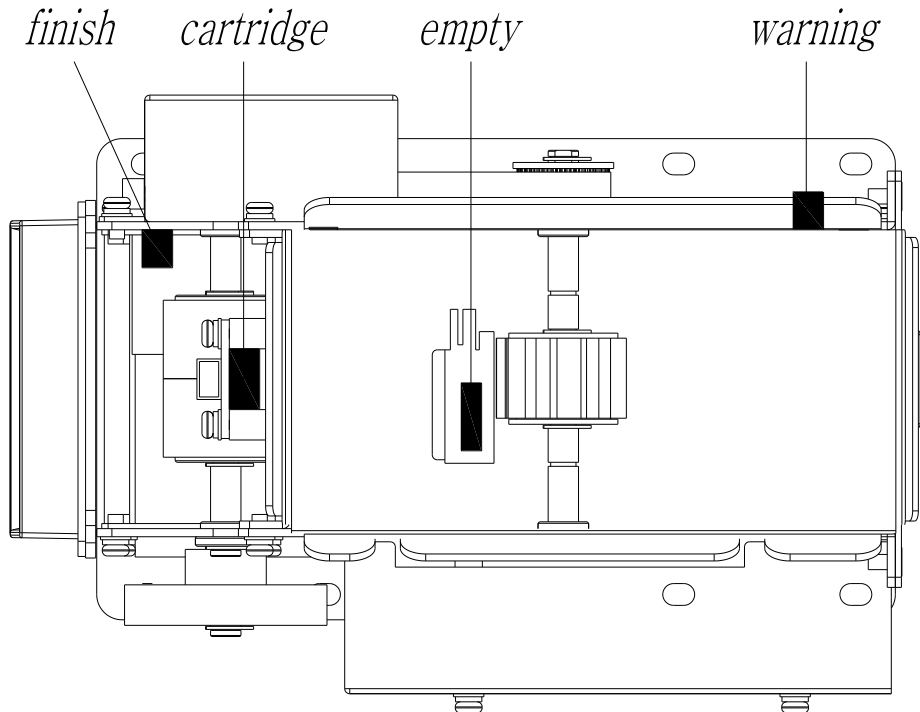
b2: 1- Finish Sensor is detected,
0- Finish Sensor is not detected.

b1: 1- Warning Sensor is detected,
0- Warning Sensor is not detected.

b0: 1- Cartridge is empty,
0- Cartridge Good.

| | | | | |
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※ Sensor Positions.



10.2.3. Issue

: Dispense the card and completely eject.

※ Command Packet

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x40) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

10.2.9. Baud Rate Set.

: Set the Baud Rate. (After receiving ACK, Command should be transmitted after 50 ms)

※ Command Packet (9600BPS)

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x50) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

※ Command Packet (19200BPS)

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x51) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

| | | | | |
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10.2.10. Get Cartridge ID.

***Before executing this command, user has to insert a cartridge and lock up at the cartridge.**

※ Command Packet .

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x90) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

※ Positive Response Packet.

| | | | | | | | |
|-----|-------|-------|-------|-------|-------|-----|-----|
| STX | Data0 | Data1 | Data2 | Data3 | Data4 | ETX | BCC |
| | | | | | | | |

※ Negative Response Packet

| | | | | | | | |
|-----|------|------|------|------|------|-----|-----|
| STX | 0xFF | 0xFF | 0xFF | 0xFF | 0xFF | ETX | BCC |
|-----|------|------|------|------|------|-----|-----|

10.2.11. Write Cartridge ID.

***Before executing this command, user has to insert a cartridge and lock up at the cartridge.**

※ Command Packet .

| | | | | |
|-----|------|------------|-----|-----|
| STX | 0xA6 | UID[5BYTE] | ETX | BCC |
|-----|------|------------|-----|-----|

***Don't use "FF FF FF FF FF" for ID, it is reserved.**

※ Positive Response Packet.

| | | | | | | | |
|-----|------|------|------|------|------|-----|-----|
| STX | 0x80 | 0x80 | 0x80 | 0x80 | 0x80 | ETX | BCC |
|-----|------|------|------|------|------|-----|-----|

※ Negative Response Packet

| | | | | | | | |
|-----|------|------|------|------|------|-----|-----|
| STX | 0xFF | 0xFF | 0xFF | 0xFF | 0xFF | ETX | BCC |
|-----|------|------|------|------|------|-----|-----|

10.2.12. Get the Number of Cards in the Cartridge.

***Before executing this command, user has to insert a cartridge and lock up at the cartridge.**

※ Command Packet .

| | | | | |
|-----|---------------|----------------|-----|-----|
| STX | Command(0x96) | Parameter(RFU) | ETX | BCC |
|-----|---------------|----------------|-----|-----|

※ Positive Response Packet.

| | | | | | | | |
|-----|-------|-------|-------|-------|-------|-----|-----|
| STX | Data0 | Data1 | Data2 | Data3 | Data4 | ETX | BCC |
| | | | | | | | |

※ Negative Response Packet

| | | | | | | | |
|-----|------|------|------|------|------|-----|-----|
| STX | 0xFF | 0xFF | 0xFF | 0xFF | 0xFF | ETX | BCC |
|-----|------|------|------|------|------|-----|-----|

| | | | | |
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10.2.13. Write the Number of the Cards in the Cartridge.

***Before executing this command, user has to insert a cartridge and lock up at the cartridge.**

※ Command Packet .

| | | | | |
|-----|------|------|-----|-----|
| STX | 0xA6 | DATA | ETX | BCC |
|-----|------|------|-----|-----|

DATA : the Number of Cards in the Cartridge (5Bytes)

***The Maximum capacity is 500 cards.**

| | | | | |
|-------|-------|-------|-------|-------|
| Data0 | Data1 | Data2 | Data3 | Data4 |
|-------|-------|-------|-------|-------|

Example: 0xF4 0x01 0x00 0x00 0x00

※ Positive Response Packet.

| | | | | | | | |
|-----|------|------|------|------|------|-----|-----|
| STX | 0x80 | 0x80 | 0x80 | 0x80 | 0x80 | ETX | BCC |
|-----|------|------|------|------|------|-----|-----|

※ Negative Response Packet

| | | | | | | | |
|-----|------|------|------|------|------|-----|-----|
| STX | 0xFF | 0xFF | 0xFF | 0xFF | 0xFF | ETX | BCC |
|-----|------|------|------|------|------|-----|-----|