**Cash Terminal**

TECHNICAL MANUAL

MODEL : KD-70CT

Rev. 0.3

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# Record of Revisions

|  |  |  |
| --- | --- | --- |
| **Revision Version** | **Date** | **DESCRIPTION** |
| V 0.1  V 0.2  V 0.3 | December.13 May.13 July.24 | Preliminary  Add F/W Setting STATUS receive update |

1. **GENERAL SPECIFICATIONS**

## Specifications

* + 1. HOPPER X 2
    2. Bill Dispenser (4 Cassettes)
    3. Bill Acceptor

## Electrical Characteristics

* + 1. Supply voltage : +12.0 , +24.0 VDC ± 1.2 V
    2. Current consumption ( at 12 V, 24 V)

|  |  |
| --- | --- |
|  | STANDBY |
| T.B.D. | T.B.D. |

## Environmental conditions

* + 1. Operating Temperature : T.B.D.
    2. Operating Humidity : T.B.D.
    3. Storage Temperature : T.B.D.
    4. Storage Humidity : T.B.D.

## Reliability

* + 1. MCBF

- T.B.D.

# CONFIGURATION

## Interfaces

* + 1. **RS-232 Serial Interface**
       1. **Specifications**
* Data transmission : Serial
* Synchronization : Asynchronous
* Handshaking : None
* Signal levels Mark = -3 to -15 V : logic “1” / off

Space = +3 to +15 V : logic “0” / on

* Baud rate : 115200 Bps
* Data word length : 8 bits
* Parity Settings : None
* Stop bits : 1 bit
* Connector (printer side) : Female D-SUB 9 pin connector
  + 1. **Interface connector terminal assignments and signal functions**

|  |  |  |  |
| --- | --- | --- | --- |
| Pin No. | Signal Name | Signal direction | Function |
| 1 | VCC |  | POWER |
| 2 | RXD | INPUT | RECEIVE DATA |
| 3 | TXD | OUTPUT | TRANSMIT DATA |
| 4 | SG | - | SIGNAL GROUND |

# COMMAND LIST

|  |  |
| --- | --- |
| Command | Name |
| ‘I’ ‘S’ | START |
| ‘I’ ‘C’ | CLOSE |
| ‘O’ ‘S’ ‘H’ ’CNT’ | HOPPER PROCESS |
| ‘O’ ‘S’ ‘P’ ’CNT’ | BILL DISPENSER PROCESS |
|  | BILL ACCEPTOR |
| ‘L’ ’TYPE’ ’R’ ’G’ ’B’ ‘BLINK’ | LEDBAR PROCESS |
| ‘I’ ‘R’ | RESET |
| ‘NUL’ ‘NUL’ | STATUS |
| ‘U’ | F/W SETTING |

## STX I S ETX

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [Name]  [Format] | Start Kiosk Coin  ASCII | Process  STX | I | S | ETX |
|  | Hex | 02 | 49 | 53 | 03 |
|  | Decimal | 02 | 73 | 83 | 03 |

[Description] Start Kiosk Coin Process, If not send Start command, disable insert Bill

[Receive Format]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OK Receive  ASCII | STX | O | S | N | NUL | ETX |
| Hex | 02 | 4F | 53 | 4E | 00 | 03 |
| Decimal | 02 | 79 | 83 | 78 | 00 | 03 |
| ERR Receive ASCII | STX | O | E |  |  | ETX |
| Hex | 02 | 4F | 45 | FF | FF | 03 |
| Decimal | 02 | 79 | 69 | 255 | 255 | 03 |

## STX I C ETX

[Name] Close Kiosk Coin Process

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [Format] | ASCII | STX | I | C | ETX | | |
|  | Hex | 02 | 49 | 43 | 03 | | |
|  | Decimal | 02 | 73 | 67 | 03 | | |
| [Description] Close Kiosk Coin Process [Receive Format] | | | | | | | |
| OK Receive | |  |  |  |  |  |  |
| ASCII | | STX | O | C | N | 00 | ETX |
| Hex | | 02 | 4F | 43 | 4E | 00 | 03 |
| Decimal | | 02 | 79 | 67 | 78 | 00 | 03 |
| ERR Receive | |  |  |  |  |  |  |
| ASCII | | STX | O | E |  |  | ETX |
| Hex | | 02 | 4F | 45 | FF | FF | 03 |
| Decimal | | 02 | 79 | 69 | 255 | 255 | 03 |

## STX O S H CNT ETX

[Name] Hopper out process

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [Format] | ASCII | STX | O | S | H | CNT | ETX |
|  | Hex | 02 | 4F | 53 | 48 or 68 | ?? | 03 |
|  | Decimal | 02 | 79 | 83 | 72 | ?? | 03 |

[Description] Hopper out process (Hopper1 = 48) (Hopper2 = 68) [Reference] CNT = 0x40 ~ 0x49 (1~10 EA) , 0x4A (Dispense all coin)

[Receive Format]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OK Receive  ASCII | STX | O | F | H | CNT | ETX |
| Hex | 02 | 4F | 46 | 48 or 68 | ?? | 03 |
| Decimal | 02 | 79 | 70 | 72 | ?? | 03 |
| ERR Receive ASCII | STX | O | E | H | CNT | ETX |
| Hex | 02 | 4F | 45 | 48 or 68 | n | 03 |
| Decimal | 02 | 79 | 69 | 72 | 255 | 03 |

n = Coin release count before an error (last process) n = 0x3F(0EA) ~ 0x49(10EA)

## STX O S P CNT ETX

[Name] Bill Dispenser out process

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [Format] | ASCII | STX | O | S | P | CNT1 | CNT2 | CNT3 | CNT4 | ETX |
|  | Hex | 02 | 4F | 53 | 50 | ?? | ?? | ?? | ?? | 03 |
|  | Decimal | 02 | 79 | 83 | 80 | ?? | ?? | ?? | ?? | 03 |

[Description] Bill Dispenser out process [Reference] CNT = 0x01 (1 EA) [Receive Format]

OK Receive

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ASCII | STX | O | F | P | STK1 | STK2 | STK3 | STK4 | RJT1 | RJT2 | RJT4 | ETX |
| Hex | 02 | 4F | 46 | 50 | ?? | ?? | ?? | ?? | ?? | ?? | ?? | 03 |
| Decimal | 02 | 79 | 70 | 80 | ?? | ?? | ?? | ?? | ?? | ?? | ?? | 03 |

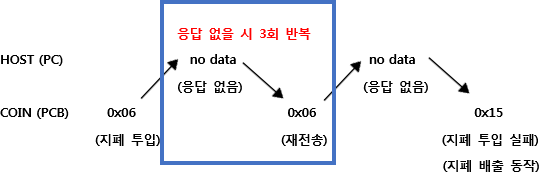
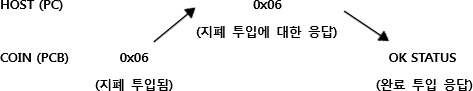
Error Receive

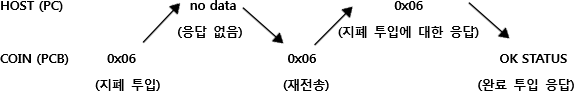
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ASCII | STX | O | E | P | STK1 | STK2 | STK3 | STK4 | RJT1 | RJT2 | RJT3 | RJT4 | ETX |
| Hex | 02 | 4F | 45 | 50 | ?? | ?? | ?? | ?? | ?? | ?? | ?? | ?? | 03 |
| Decimal | 02 | 79 | 69 | 80 | ?? | ?? | ?? | ?? | ?? | ?? | ?? | ?? | 03 |

## BILL ACCEPTOR

[Name] Bill Acceptor [Description] Bill Acceptor

[Reference] CNT = 0x40 -> 5 RS, 0x41 -> 10 RS, 0x42 -> 20RS, 0x43 -> 50 RS, 0x44 -> 100 RS, 0x45 -> 500 RS 0x47 -> 2000 RS, 0x48 -> 200 RS





[Receive Format]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OK Receive  ASCII | STX | I | F | B | CNT | ETX |
| Hex | 02 | 49 | 46 | 42 | ?? | 03 |
| Decimal | 02 | 73 | 70 | 66 | ?? | 03 |
| ERR Receive ASCII | STX | I | E | B | CNT | ETX |
| Hex | 02 | 49 | 45 | 42 | FF | 03 |
| Decimal | 02 | 73 | 69 | 66 | 255 | 03 |

## Bill Acceptor START/CLOSE

   START : 02 42 4F 03   Response : 02 42 41 4F 00 03

CLOSE : 02 42 58 03 Response : 02 42 41 58 00 03

## STX L TYPE R G B BLINK ETX

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [Name] | Led bar process |  | | | | | |
| [Format] | ASCII | STX | L | TYPE | R G B | BLINK | ETX |
|  | Hex | 02 | 4C | ?? | ? ? ? | ?? | 03 |
|  | Decimal | 02 | 76 | ?? | ? ? ? | ?? | 03 |
| [Description] | Led bar color |  |  |  |  |  |  |

[Reference] TYPE = 00(all), 01(21), 02(7\_Bill), 04 (7\_Card) , R(00~FF), G(00~FF), B(00~FF)

BLINK = 0(Nomal), 1(BLINK)

EX) Send : 02 4C 00 05 00 00 00 03

Proc : All Led bar on RED Receive : 02 6C 00 05 00 00 00 03

Send : 02 4C 04 00 05 00 01 03

Proc : 7\_Card Ledbar on GREEN BLINK Receive : 02 6C 04 00 05 00 01 03

[Receive Format]

Same send data. Change ‘L’(4C) -> ‘l’(6C)

## STX I R ETX

[Name] Reset Kiosk Coin

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [Format] | ASCII | STX | I | R | ETX |
|  | Hex | 02 | 49 | 52 | 03 |
|  | Decimal | 02 | 73 | 82 | 03 |

[Description] Reset Kiosk Coin [Notes]

[Reference]

## STX NUL NUL ETX

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [Name] | Status command |  | | | | | | |
| [Format] | ASCII | STX | NUL | NUL | ETX | | | |
|  | Hex | 02 | 00 | 00 | 03 | | | |
|  | Decimal | 02 | 00 | 00 | 03 | | | |
| [Description] | Check status |  |  |  |  | | | |
| [Receive Format] | | | | | | | | |
| ASCII | | STX | TYPE | H1 | P | B | H2 | ETX |
| Hex | | 02 | ?? | ?? | ?? | ?? | ?? | 03 |
| Decimal | | 02 | ?? | ?? | ?? | ?? | ?? | 03 |
| [Reference] |  |  |  |  |  |  |  |  |

\*\*\*\* TYPE \*\*\*\*

0x00 : Wait 0x01 : Start 0x02 : Signal check 0x03 : Reset 0x04 : Hopper process 0x05 : Bill dispenser process

0x06 : Bill accepter process

\*\*\*\* H ( HOPPER ERR CODE ) \*\*\*\* 0x00 => Nomal

0x01 => Motor problem 0x02 => Insufficient Coins

0x03 => Detects coin dispensing activity after suspending the dispense signal 0x04 => Reserved

0x05 => Prism Sensor Failure (Jam) 0x06 => Shaft Sensor Failure

0x80 => Signal Err

\*\*\*\* P ( DISPENSER ERR CODE ) \*\*\*\*

다기원 에러 사양과 동일

0x20 => TS2L

0x20 => TS2R

0x40 => TS3L

0x40 => TS3R

0x80 => TS4L

0x80 => TS4R

0x01 => SS11 (1 stack Near end) 0x02 => SS12 (2stack Near end)

Ex1) 1 stack Near end(on), TS2L(on) => 0x21

Ex2) 1 stack Near end(on), TS2L(on), TS3R(on) => 0x61 Ex2) TS2L(on), TS4L(on) ), TS4R(on) => 0xA1

\*\*\*\* B( ACCEPTOR ERR CODE ) \*\*\*\* 0x00 => Nomal

0x01 => ERR

0x80 => Signal Err

## STX U

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [Name] | Denomination setting |  | | | | | |
| [Format] | ASCII | STX | U | SET\_B | SET\_M | SET\_STA | ETX |
|  | Hex | 02 | 55 | ?? | ?? | ?? | 03 |
|  | Decimal | 02 | 85 | ?? | ?? | ?? | 03 |

[Description] F/W SET SAVE FLASH [Reference] READ SETTING (Check ASCII)

=>SET\_B = 0x00 , SET\_M = 0x00, SET\_STA = 0x00 EX) 02 55 00 00 00 03

SAVE SETTING =>

SET\_B(Acceptor bill type set) 0x01 5 Rs

0x02 10 Rs

0x04 20 Rs

0x08 50 Rs

0x10 100 Rs

0x20 500 Rs

0x40 2000 Rs

0x80 200 Rs

SET\_M (module set) 0x10 Bill AC

0x20 Bill Dis 0x40 Hopper1 0x80 Hopper2

SET\_STA (Second stack type set) 0x00 ~ 0xFF

(if SET\_STA = 0x0A and Dispenser command 0x0F Dispenser process first stack 5bill, Second stack 1bill)

EX) 02 55 77 F0 0A 03 = 50Rs,200Rs Off, stack type 0x0a

02 55 FE 70 05 03 = 5Rs Off, Hopper2 Off, stack type 0x05

02 55 0F 30 05 03 = 100Rs,500Rs,2000Rs,200Rs Off,

Hopper1,Hopper2 Off, Stack type 0x05

# Programming guide

//PROCESS START Command

\* All command will not response without START command except Check Status command. START command is required for every cash transaction.

byte[] start\_command = { 0x02,0x49,0x53,0x03 }; serialPort\_CashTable.Write(start\_command, 0, start\_command.Length);

//PROCESS CLOSE Command

\* After each transaction completed, CLOSE command is required. All other command will not response after CLOSE command except check status and start command.

byte[] end\_command = { 0x02, 0x49, 0x43, 0x03 }; serialPort\_CashTable.Write(end\_command, 0, end\_command.Length);

//PROCESS Cash dispense command

\*

byte[] command = { 0x02, 0x4f, 0x53, 0x50, 0x00, 0x03 };

command[4] = Convert.ToByte(comboBox\_bill.Text); serialPort\_CashTable.Write(command, 0, command.Length);

//PROCESS Coin dispensing command

\*

byte[] command = { 0x02, 0x4f, 0x53, 0x48, 0x00, 0x03 };

switch (comboBox\_coin.Text)

{

case "1":

command[4] = 0x40; break; case "2":

command[4] = 0x41; break; case "3":

command[4] = 0x42; break; case "4":

command[4] = 0x43; break; case "5":

command[4] = 0x44; break; case "6":

command[4] = 0x45; break; case "7":

command[4] = 0x46; break; case "8":

command[4] = 0x47; break; case "9":

command[4] = 0x48; break; case "10":

command[4] = 0x49; break;

}

serialPort\_CashTable.Write(command, 0, command.Length);

//PROCESS RESET Command

\*Reset in case of Error

byte[] command = { 0x02, 0x49, 0x52, 0x03 }; serialPort\_CashTable.Write(command, 0, command.Length);

//PROCESS Check STATUS Command

\*Check the device status

byte[] command = { 0x02, 0x00, 0x00, 0x03 }; serialPort\_CashTable.Write(command, 0, command.Length);

//PROCESS When Bill Acceptor Received

if (buffer[1] == 0x49)

{

if (buffer[4] == 0xff)

{

status\_billaccepter\_text = "ERR";

}

else {

}

if (buffer[4] == 0x40) status\_billaccepter\_text = "Received INR5";

else if (buffer[4] == 0x41) status\_billaccepter\_text = "Received INR10"; else if (buffer[4] == 0x42) status\_billaccepter\_text = " Received INR20"; else if (buffer[4] == 0x43) status\_billaccepter\_text = " Received INR50";

status\_billdispenser\_text = ""; status\_hopper\_text = "";

}

//PROCESS Coin Hopper Error

if (buffer[3] == 0x48)

{

if (buffer[4] == 0xff)

{

status\_hopper\_text = "ERR";

}

}

//PROCESS Cash Dispenser Error

if (buffer[3] == 0x50)

{

if (buffer[4] == 0xff)

{

status\_billdispenser\_text = "ERR";

}

}