SMART Series

SMART-21S, SMART-21R

User Manual



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In order to make a warranty claim you must contact an IDP Reseller. You will be responsible for packaging the printer for shipment and the costs of shipping and insurance of the printer from the point of use of the printer to the IDP Reseller. The IDP Reseller will bear the costs of shipping and ensuring the printer from the repair location to the address from which the printer was shipped.

Before returning any equipment for in-warranty or out of warranty repair, contact an IDP Reseller or an IDP Service Center for a Return Materials Authorization (RMA) number. Repack the equipment in the original packing material and mark the RMA number clearly on the outside of the box. For more information about RMA or IDP warranty statements, refer to the Warranty booklet on the quick install guide.

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1. Introduction

1.1 Printer outside features

For the user's convenience, SMART-21 status can be seen through LED and the printer can be controlled by LED button. It takes a power via the 24V adaptor provided with the printer. Using USB and Network port, it is communicated with the user's PC

The following shows the outside functional features found on the printer.



① **Top cover open button**

② **Fan**

③ **Card slot**

④ **LED buttons**

Figure 1 SMART-21 front features



⑤ **Power switch**

⑥ **24V power connector**

⑦ **USB port**

Figure 2 SMART-21 rear features

There are three models in SMART-21 card printer series such as SMART-21S, SMART-21R.

SMART-21S (Figure.3) is the standard card printer. It can be printed in single side with the encoding. This manual is prepared based on SMART-21S.

SMART-21R (Figure.4) is the rewritable card printer. It can rewrite on rewritable card in single side with encoding.



Figure 3 SMART-21S (Standard)



Figure 4 SMART-21R (Rewritable)

1.2 Printer inside features

In SMART-21 printer, the ribbon is installed by a ribbon cartridge which can be used semi permanently. The following shows the inside functional features found on your SMART-21 printer.



Figure 5 SMART-21 Inside features

① Card slot

Manually feed the cards and collect the printed cards one by one through the card slot.

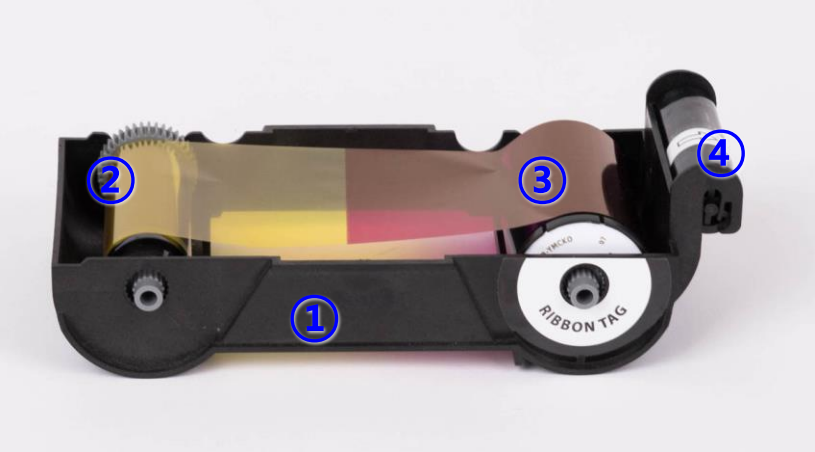
② Ribbon cartridge

Install the ribbon and the disposable cleaning roller.

③ Thermal Print Head

This enables the cards to be printed.
(Caution: This is very hot after printing. Do not contact the surface of the Thermal Print Head with fingers or a sharp metal object to avoid degrading print quality or damaging printer head permanently.)

1.3 Ribbon cartridge features



① **Ribbon cartridge**

② **Take up parts**

③ **Supply parts**

④ **Disposable cleaning roller**

Figure 6 Ribbon cartridge features

① Ribbon cartridge

-. Install a ribbon and a disposable cleaning roller provided with the ribbon.

-. In the case of SMART-21 RW model, a ribbon is not used, and a disposable cleaning roller is only installed and used.

-. This semi-permanent ribbon cartridge is a component of the printer. Printer does not operate if it is broken or damaged. In this case, please contact printer reseller.

② ③ Take up & Supply parts

-. Ribbon is wrapped to the supply parts as the Picture. It should be installed as the Figure.6

④ Disposable cleaning roller

-. It removes dust on the surface of card to improve print quality before the card is printed. It should be changed together with the ribbon.

-. After installing the disposable cleaning roller to the ribbon cartridge, peel off the protective film.

-. It is provided with the ribbon.

-. In the case of SMART-21 RW model, you must purchase the disposable cleaning roller from the reseller.

1.4 Display and Buttons

The status of SMART-21 is displayed on the Watchman program of the Windows tray.

The simple status of SMART-21 is displayed by color of LED. It is red when boot up.

It is changed to ‘System Ready’ if the printer is fine. It is change to ‘Printing’ when the printer is working. In case of sensing an error, it is changed to ‘Error’ status. Whenever the top cover is opened, the operation is stopped and the status is ‘Top Cover Open’.



Figure 7 Watchman Pop-up

2. Printer installation

2.1. Connecting a power and a USB cable

Connect the power and USB cable as the below picture.



Figure 8 SMART-21 Connection of power and USB cable

2.2. Fitting the ribbon

Before printing, prepare the related items such as a card, a ribbon and a cleaning roller. In this section we invite you to know the proper method of installing the ribbon and the cleaning roller into the printer.

(1) Turn off the printer

(2) Open the printer top cover by pressing the top cover open button.



Figure 9 Top Cover open

(3) Take out the ribbon cartridge.



Figure 10 Take out the ribbon cartridge

(4) Install a ribbon into the ribbon cartridge as the right picture.



Figure 11 Loading the ribbon 1

(5) Insert the supply side of the ribbon to no.1 hole and press the opposite (no.2). Insert the take-up side of the ribbon same method to no.3 and no.4. After inserting, tighten the ribbon.

(Caution! If the ribbon is not tightened, a rolling up error might be happened.)

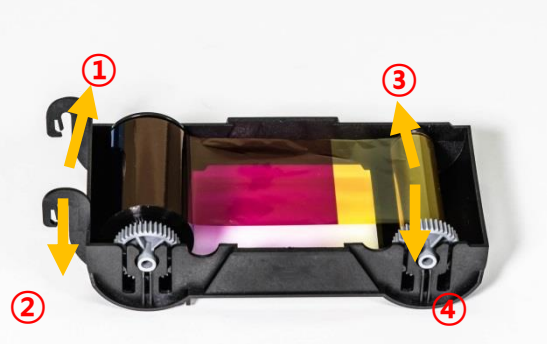


Figure 12 Loading the ribbon 2

(6) Install the disposable cleaning roller to the ribbon cartridge.

(The ribbon tag side of the supply core should be mounted in the direction of the ribbon tag marking on the cartridge.)



Figure 13 Installing the cleaning roller

(7) Peel the protective wrapper from the cleaning roller.

After removing the protective wrapper, the cleaning roller should be kept clean from fingerprints, dust and foreign substances to avoid contamination because it is adhesive.

(Caution! Do not use without peeling off the protective wrapper because the cleaning roller cannot perform its function.)



Figure 14 Peeling the protective wrapper

(8) Install the ribbon cartridge into the printer after installing the ribbon with a cleaning roller to the cartridge.



Figure 15 Installing the ribbon cartridge

(9) Close the top cover

(If it is not closed properly, check the installation state of the ribbon cartridge.)



Figure 16 Close Top Cover

2.3. Loading the card

This section shows how to feed the plastic card.

(1) Insert a card into the card slot.

The card will be automatically moved into the standby position and ready to print.

Or if click the "Print" button on the PC before inserting, the printer's LED Button blinks and waits until card to be supplied.

Caution! Do not touch the surface of the card by finger because it affects the printing quality.



Figure 17 Loading the card 1



Figure 18 Loading the card 2

(2) To cancel and get back the fed card before printing:

Pull out the card as shown figure.



Figure 19 Unloading the card

2.4. The withdrawal of printed card.

Printed cards are passed out to the card slot of SMART-21 printer.



Figure 20 SMART-21 Withdrawal a card

2.5. Driver installation (Windows 7 / 8 / 10)

(1) Please insert the installation CD.



Figure 21 Install Windows driver 1

(2) Please choose language and click “Driver Install”.



Figure 22 Install Windows driver 2

(3) When “User Account Control” window is opened, click “Yes”



Figure 23 Install Windows driver 3

(4) STEP 1:

Please turn off printer if it is connected to PC. Please click “Next”.
When you click “Next”, older driver will be removed automatically.

This process will take several minutes to remove older driver.

You can select the languages by selecting the combo box as shown on the left picture.

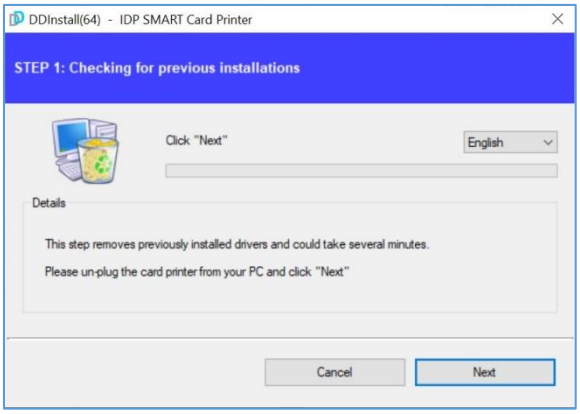


Figure 24 Install Windows driver 4

(5) STEP 2:

When you click “Next”, the driver installation will be ready.

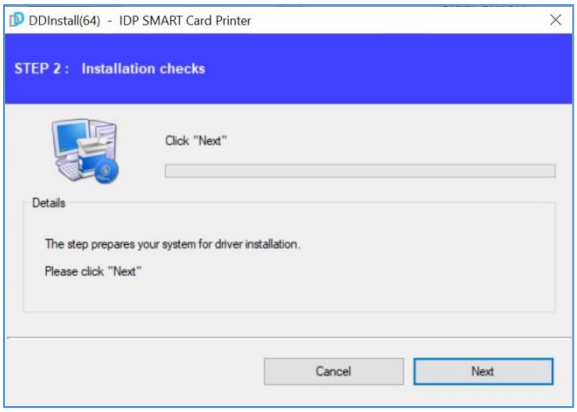


Figure 25 Install Windows driver 5

(6) STEP 3: USB

Please click “Next” if printer is connected to USB only.

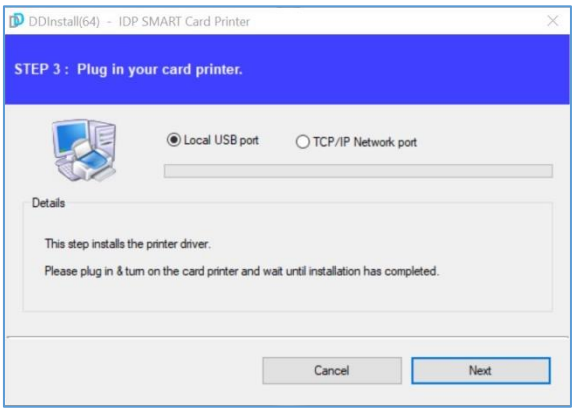


Figure 26 Install Windows driver 6

(7) Please turn on the printer

(Caution! Connect the USB Cable to the computer before Power on the printer.)



Figure 27 Install Windows driver 7

(8) When driver installation is completed, please click “Close”

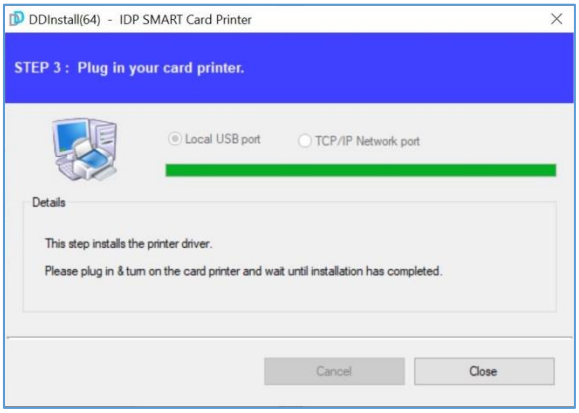


Figure 28 Install Windows driver 8

(9) Insert a card into the card slot.

The card will be automatically moved into the standby position and ready to print.



Figure 29 Install Windows driver 9

(10) Please open “Devices and Printers” from “Hardware and Sound”. Please check if “IDP SMART-21 Card Printer” is created.

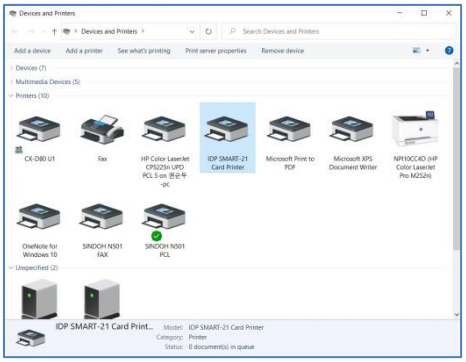


Figure 30 Install Windows driver 10

(11) Please click the right mouse button after cursor is placed on “IDP SMART-21 Card Printer” icon. Click “Printer properties”.

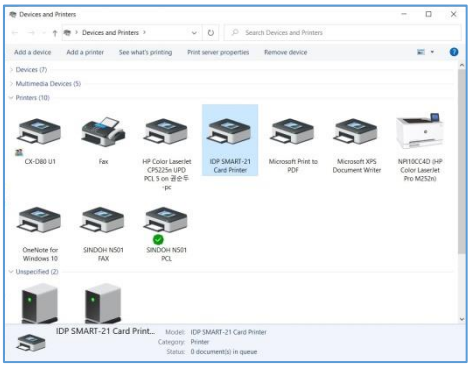


Figure 31 Install Windows driver 11

(12) Please select “general” tab and click “Print test page” in “IDP SMART-21 Card Printer Properties” window.

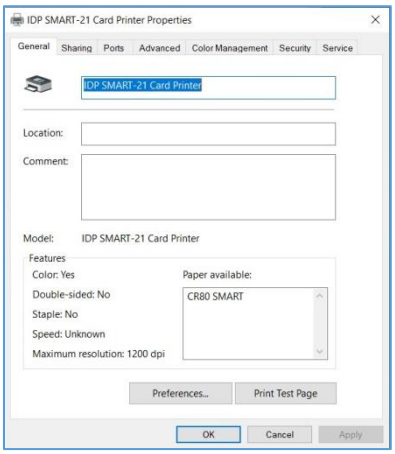


Figure 32 Install Windows driver 12

(13) Please check test card if it is printed properly and click “Close” if a card is printed properly.

(If card is not printed or error comes out, please refer to “Trouble Shooting”.)

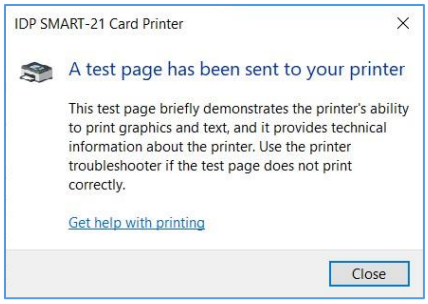


Figure 33 Install Windows driver 13

3. Driver configuration

3.1. Printer Properties

To check printer properties, you need to open printer driver. Please open “Devices and Printers” and right-click “IDP SMART-21 Card Printer”.

Click “Printer Properties”.

(1) Printing Preferences

Please click “Preferences…” shown on the bottom of the left picture.

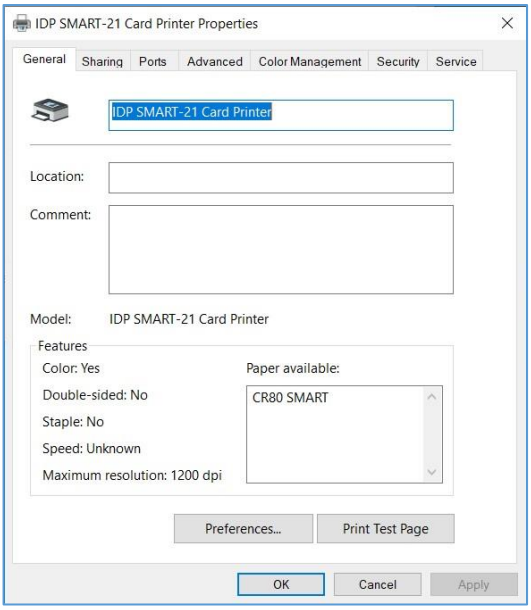


Figure 34 Printer properties

(2) Layout

- You can select either horizontal or vertical printing direction. To apply your selection, click “OK”.

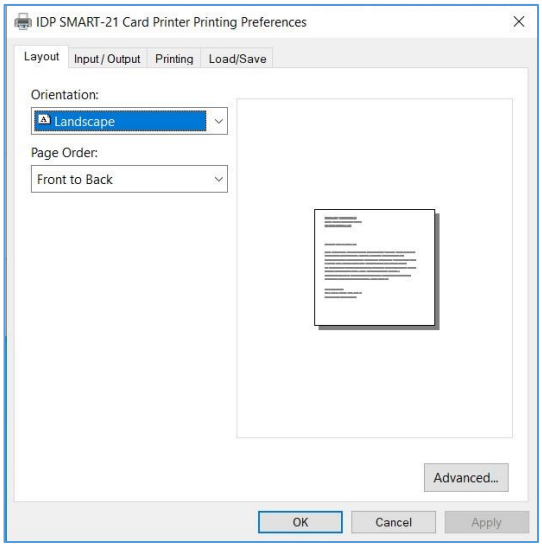


Figure 35 Layout

(3) Input / Output

[Supply Tray]

Supply: You can select “Auto” if SMART-21 has 1 input hopper. Please select the hopper if it has a multi hopper.

Tray: You can select “CR-80” because SMART-21 supports CR80 cards only.

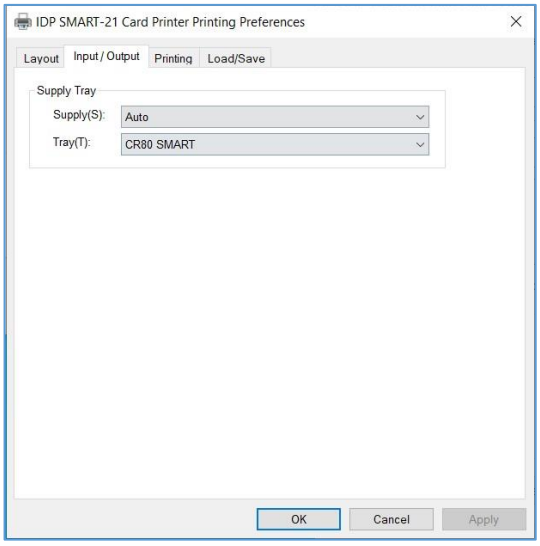


Figure 36 Input / Output

(4) Printing

Do Printing: You can select printing or not

[Print Side]

Side: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

[Front / Back]

Color: You can select color or mono print.

Flip: You can flip an image

Media / Mask: You can indicate the area to print by using a predefined mask or user defined mask (white card, smartcard, Magnetic stripe card, etc.) on front or back side.

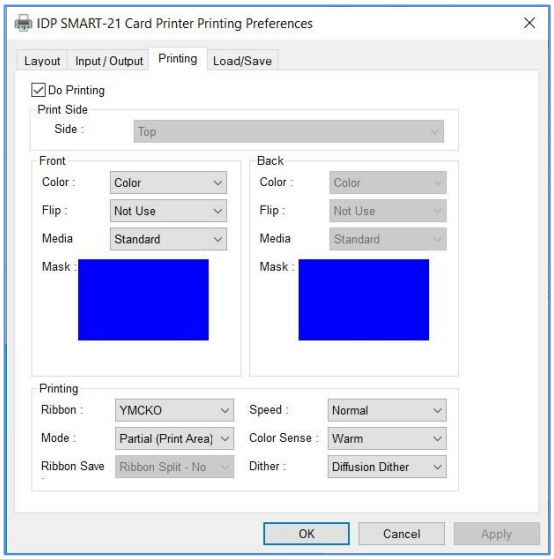


Figure 37 Printing

You can define a mask.

User defined mask uses BITMAP file (1012 X 636 pixels).

Blue (RGB(0,0,255)): Print and Overlay

Sky Blue (RGB(0,255,255)): Overlay only

Pink (RGB(255,0,255)): Print only

Yellow (RGB(255,255,0)): Florescent

[Printing]

Ribbon: It shows the type of installed ribbon. You do not need to select this option as SMART-21 recognizes ribbon automatically with RF Tag.

Speed: Set printing speed and quality

Mode: Set printing mode

Standard: Default print mode. Prints all area of printing

Partial: Partial print mode. It is printed

partially for the print area only. Printing speed can be faster than standard mode.

Color Sense: Set print image's color sense.

Dither: There are 3 possible selections, Threshold, Random, and Diffusion Dither. It is performed with K and KO ribbon only. (Please select "Diffusion Dither" for high quality.)

Ribbon Save: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

(6) Encoding

This tap will be shown only when Magnetic encoder is installed.

Do Encoding: You can select encoding or not

Coercivity: You can select the coercivity to encode

Loco: 300, 600 Oe.

HiCo: 2760 Oe.

SpCo: 4000 Oe.

Auto: Defined automatically

Repeat Count: You can select the retry count to encoding when encoding is failed

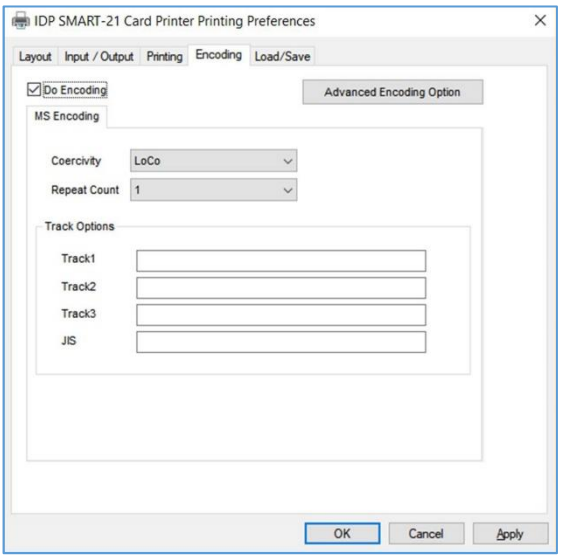


Figure 38 Encoding

(7) Encoding Advanced Option

Card Stripe Side: The location of magnetic stripe [Bottom / Top]

Before Flip: Do flipping before encoding [No / Yes]

After Flip: Do flipping after encoding

[No / Yes]

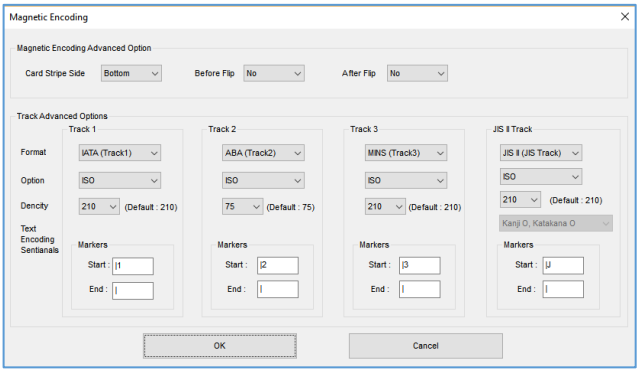


Figure 39 Magnetic Encoding Advanced Option

- **Track Advanced Options:**

Format: Encoding format (IATA, ABA, MINS, JISII, Bits Mode)

Track 1: (default) IATA

Track 2: (default) ABA

Track 3: (default) MINS

JIS II Track: (default) JIS II

Density: MS encoding density (210, 75)

Text Encoding Sentinels: Start, End Marker for text magnetic encoding

Start: Start Marker

End: End Marker

3.2. Advanced Options

To change the detailed configuration, In the ‘Layout’ tab shown, please click “Advanced…” shown on the bottom of the ‘Layout’ tab of the ‘Preferences’.

- **Reset Default Values:** Reset to default.

- **Color Correction:** You can correct gamma for colors. You need to use CardPrinterConfig to adjust color densities.
  - **Main [-100:100]:** Correct gamma for all panels
  - **Yellow [-100:100]:** Correct gamma for yellow panel
  - **Magenta [-100:100]:** Correct gamma for magenta panel
  - **Cyan [-100:100]:** Correct gamma for cyan panel
  - **Black [-100:100]:** Correct gamma for black panel
  - **Overlay [-100:100]:** Correct gamma for overlay panel

- **Position Processing:** Set criteria for resin black processing.
  - **Color [-32:32]:** to set the position of color panels
  - **Mono [-32:32]:** to set the position of resin or mono panel
  - **Overlay [-32:32]:** to set the position of overlay panel

- **Resin Black(K) Processing:** Set criteria for resin black processing.
  - **Text [0:100]:** to set density criteria for extracting black objects
  - **Dot [0:100]:** to set density criteria for extracting black dots
  - **Threshold [0:100]:** to set density criteria on dithering
  - **Dithering Degree [0:100]:** to set sharpness on dithering
  - **Resin Extraction:** You can set the method to extract resin black when you use design programs. (If you use the SMART IDesigner, you do not need to select this option.) It will be set automatically.

- **Black Object:** to extract resin black automatically for text, line, box, circle, binary images, etc.
- **Black Text**: to extract resin black for text only
- **Black Dots**: to extract resin black for all black
- **Black Dots only**: to extract resin black for all black and not to print on color panels
- **Not Use**: not to extract resin black

- **Extra Controls:** Other options
  - **Fast Alignment [On/Off]:** to set the position of input card to the magnetic encoder or normal printing. If it is on, the printer can save the time to encode
  - **Rewritable Erase Density [0:100]:** to set Erase Density on Rewritable printer

- **Wait Option:**
  - **Wait at Internal Module Contactless Encoding Position [On/Off]:** to set whether to wait at the Internal RF encoder or not
    - **Card Side [Front/Back]:** to set the direction of card when waiting
    - **Wait Position [-100:100]:** to set the position of card to wait from the criteria position. Unit is 0.1mm
    - **Wait Time [0:1000]:** to set time to wait. Unit is second
  - **Wait at External Module Contactless Encoding Position [On/Off]:** to set whether to wait at the External RF encoder or not
    - **Card Side [Front/Back]:** to set the direction of card when waiting
    - **Wait Position [-100:100]:** to set the position of card to wait from the criteria position. Unit is 0.1mm
    - **Wait Time [0:1000]:** to set time to wait. Unit is second
  - **Wait at Internal Module Contact Encoding Position [On/Off]:** to set whether to wait at the Internal IC encoder or not
    - **Card Side [Front/Back]:** to set the direction of card when waiting

- **Wait Position [-100:100]:** to set the position of card to wait from the criteria position. Unit is 0.1mm
- **Wait Time [0:1000]:** to set time to wait. Unit is second

3.3. Other settings

(1) Sharing

You can share a printer with Sharing tab via Network.

Default is unchecked “Share this printer”.

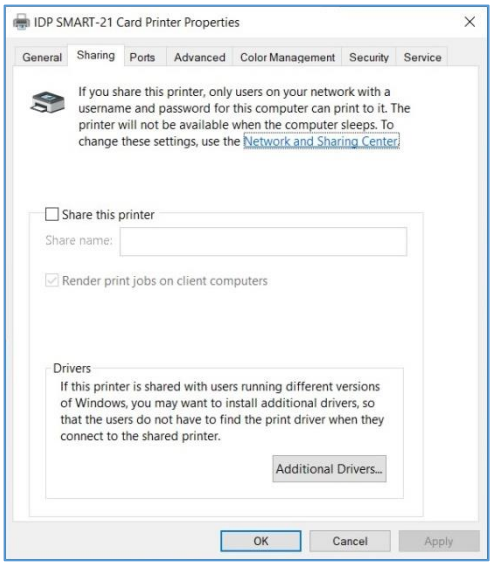


Figure 40 Printer sharing

(2) Ports

Port tab shows which port is connected with SMART-21. SMART-21 has connection with USB Virtual printer port as left picture because SMART-21 uses USB connected to PC.

(Caution! This port is selected automatically. It is recommended to maintain default.)

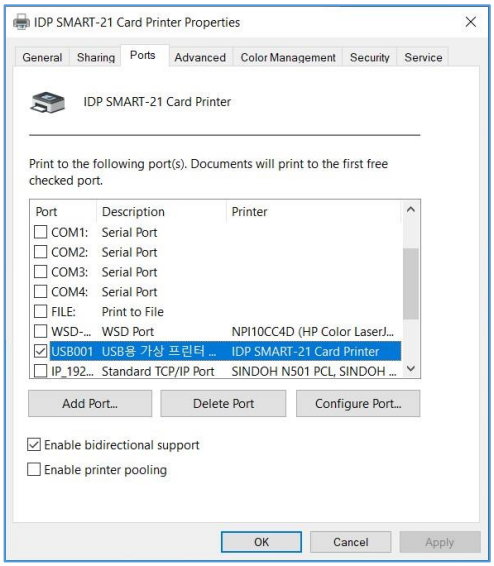


Figure 41 Ports

(3) Advanced

It is available for Working Time setting, Priority order, Spool print etc. in “Advanced” tab. “Advanced” setting follows MS Windows standard. If you want to change the setting, please refer to the Window manual.

(It is recommended to maintain default.)

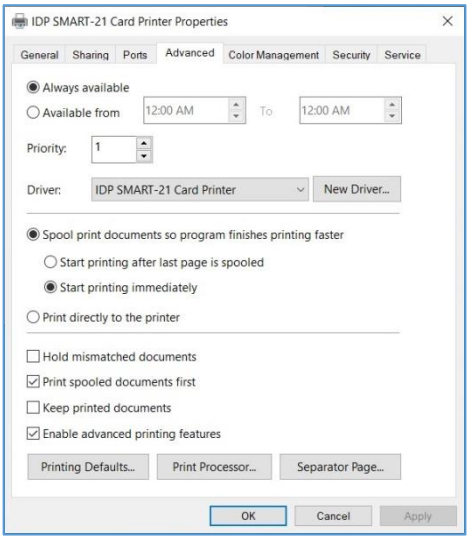


Figure 42 Advanced

(4) Color Management

In “Color management” tab, you can select color management profile fit to the printer.

SMART-21 uses color profile to express optimal color. The driver selects color profile automatically to fit each ribbon.

(It is recommended to maintain default.)

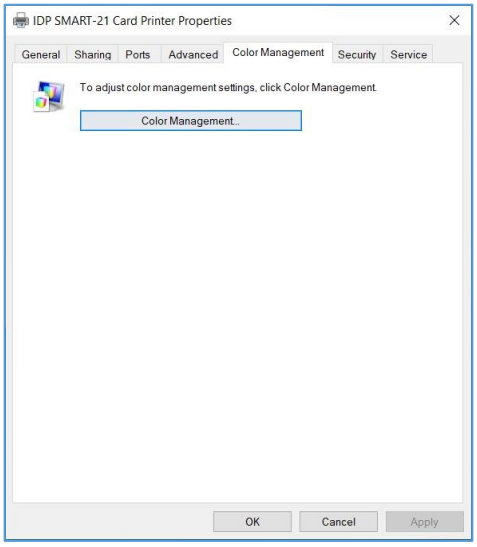


Figure 43 Color Management

(5) Security

You can set the permission to use a printer. Depend on the permission, the certain group or user can print, manage the printer/documents or not.

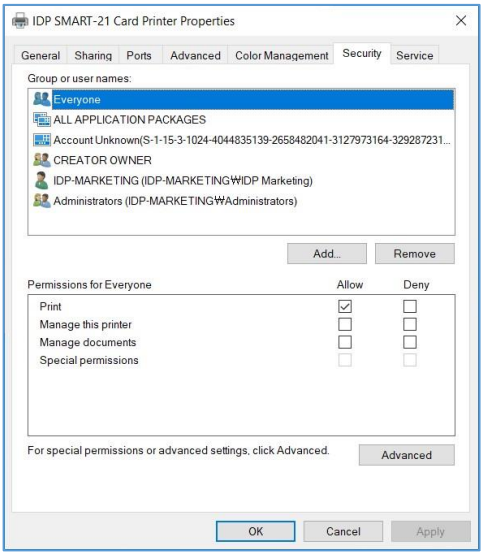


Figure 44 Security

(6) Service

You can recognize the modules to connect, printer serial, printer ID, driver version, firmware version, type of ribbon & balance and printer's status.

You can print the "technical support sheet" on a card to check printer's setup value.

To clean printer, please insert a cleaning card in a hopper and click "Clean Printer". For further details, please refer to "5.2. Cleaning Printer".

Please click "Config Printer" to change the printer settings. For further details, please refer to "4. Utilities".

Click the "Upgrade Firmware" to popped up the firmware upgrade window. For further details, please refer to "4.4 Firmware update"

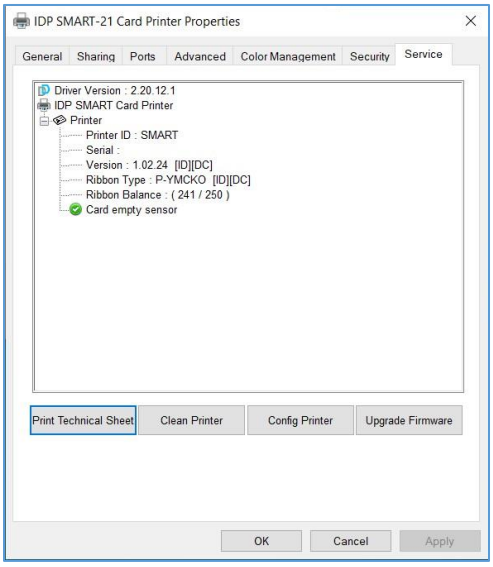


Figure 45 Service

4. Utilities

4.1. Card Printer Config

SMART-21 is produced with optimized setting. You need to adjust setting value if required or spare parts are replaced using CardPrinterConfig in the “Utilities package”.

(Available for download at **www.idp-corp.com**)

You can adjust following settings with CardPrinterConfig.

(1) Run CardPrinterConfig

Password input window is displayed when you run this program. If you input the correct password, the recorded setup value will be shown, and you can change values. The password is saved to SMART-21 printer. So, if you use another PC with same printer, previous password is required to run this program. (Default password is none. Please press OK if you have not set password.)

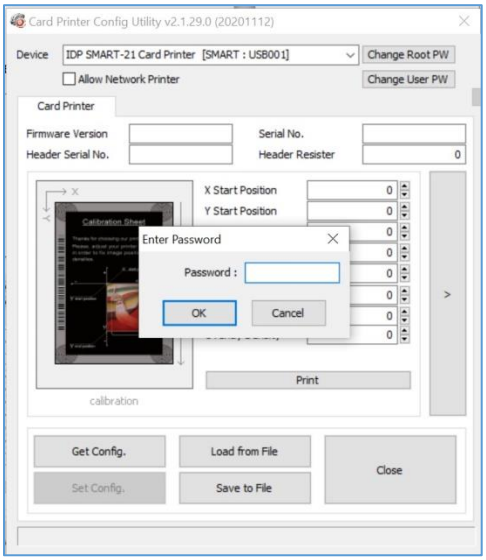


Figure 46 CardPrinterConfig Log-in

When you are successful to log-in, you can set values shown as left picture.

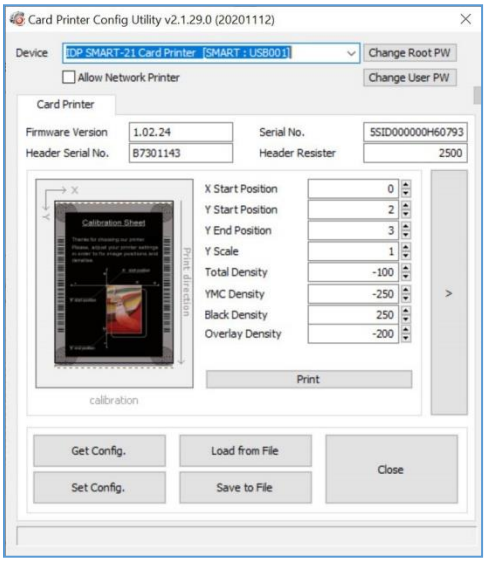


Figure 47 CardPrinterConfig start

(2) Card Printer Basic Setup

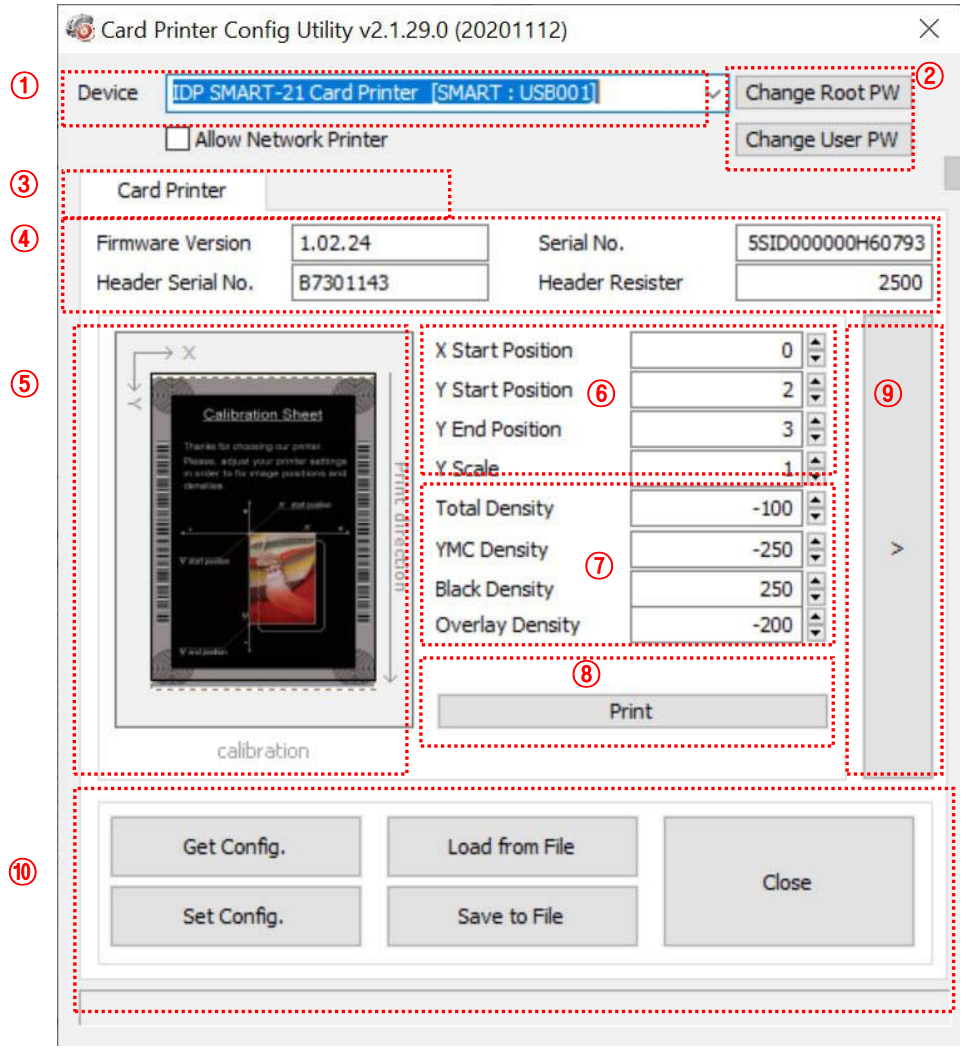


Figure 48 CardPrinterConfig – Card Printer Basic Setup

① To show connected printers

Device: You can select a printer using pull-down menu. “IDP SMART-21 Card Printer” is a name of printer. “SMART” is printer ID, “USB001” is connected port. If you connect the Network printer, please check the “Allow Network Printer” and select in the pull-down menu.

② To set administrator password and user password.

Change Root PW: To set administrator (root) password. This password is used to verify user authority for CardPrinterConfig and User Authentication. Also, it is required for User password management. (Please set password for security use.)

Change User PW: To set user password for User Authentication.

③ Click “Card Printer” tab.

④ To show firmware version, serial number of printer and serial number, resister & type of print head.

⑤ To show print area. It shows exaggeratingly for user convenience.

⑥ To set print area. Please set it properly to print on an entire card because SMART-21 is a direct thermal card printer. When you click “⑦ Print”, a card is printed as like “④ example”. Please set values properly that all circles of each corner are printed, and blank spaces are 0.4mm ~ 0.5mm in the top and the bottom of a card. Please set values by following order.

X Start Position: Please set right and left properly by adjusting X position.

Y Start Position: Please set the start position of printed example image and blank space in the top is 0.4mm ~ 0.5mm.

Y End Position: Please set the end position of printed example image and blank space in the bottom is 0.4mm ~ 0.5mm. It is recommended to set bigger value for “Y scale” than default.

Y Scale: Please set to show circles in the bottom.

To set density. SMART-21 enables to set different density for each color, resin black and overlay. So, please set each density for high quality. Please optimize the quality by adjusting each value. To optimize, you repeatedly adjust the density and print a Calibration card and check the print state until you get the optimum.
If your printer is SMART-21 RW model, please do not install ribbon. You can set density with Rewritable cards. Please adjust total density only.

Total Density: To set all the density (Color, Black and Overlay) at one time.

If your printer is SMART-21 RW model, when the density is too strong, you will have darker background color. (Background color may vary depending on card type.) When density is proper, texts and images are printed clearly and there is no background color. When density is too low, texts and images are printed dull.

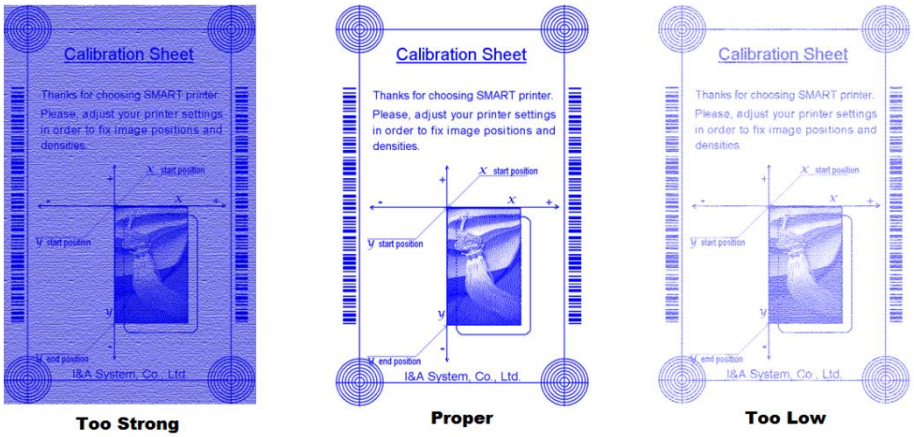


Figure 49 SMART-21 RW density

YMC Density: To set color density. Please maximize YMC density as you can, which enables to express range of color and vivid images. If it is too strong, green or red marks are appeared. If it is too weak, the print quality will be dull.

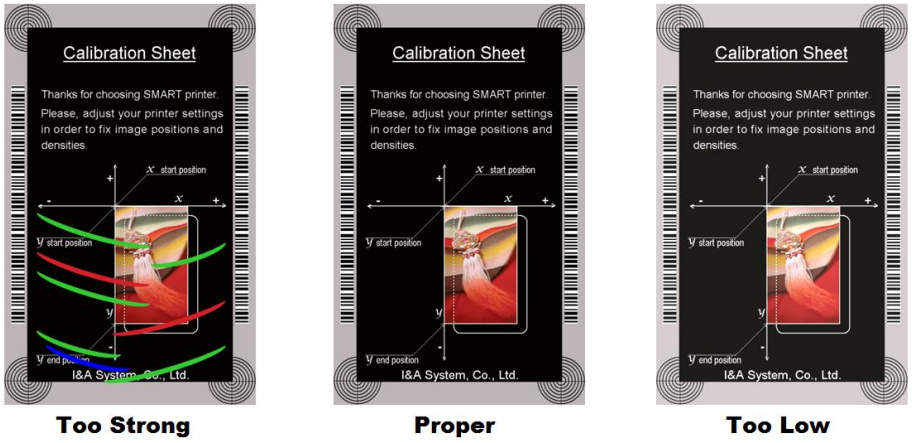


Figure 50 Color density

Black Density: To set resin black density. In the picture, barcode is printed to express density.

When density is too strong, barcode is printed too thick. When density is too weak, barcode is too thin. Please adjust resin black density to express clear barcode. Please refer to the following pictures.

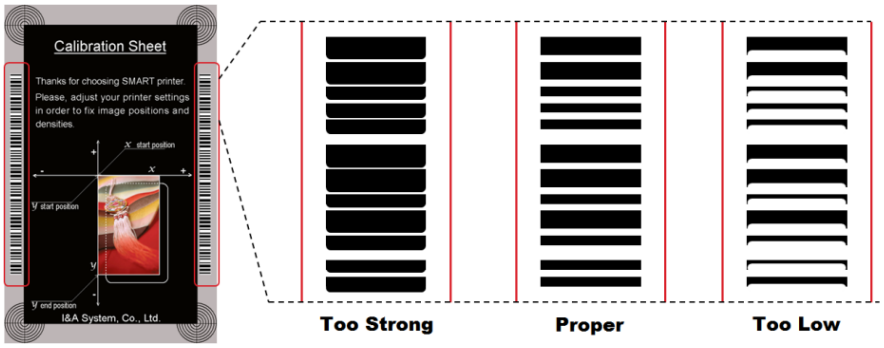


Figure 51 Resin Black density

Overlay Density: To set overlay density. Please set it when overlay is printed on surface regularly. If it is too strong, it is hazy, and marks are appeared. If it is too weak, overlay panel is not printed edge areas. You can check it with printed card under the light.

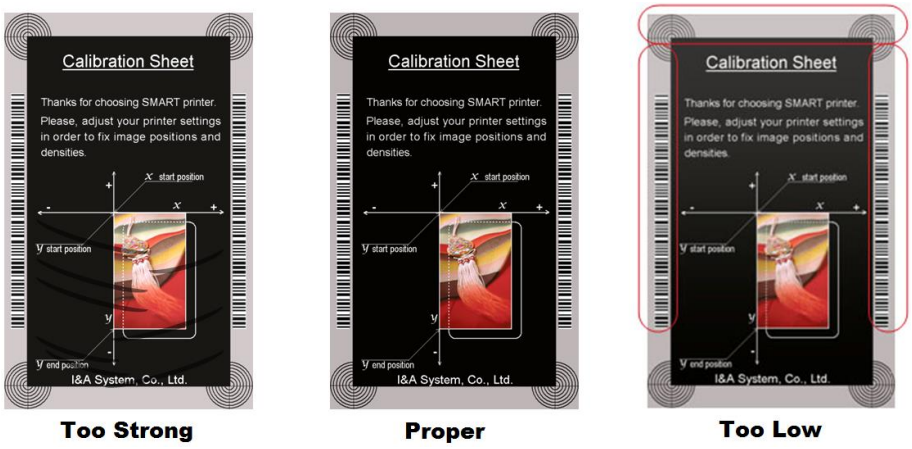


Figure 52 Overlay density

⑦ To print calibration card.

⑧ To show advanced Setup.

(It is recommended not to set advanced setup.)

⑨ To load or save values.

Get Config.: to get values from current printer

Set Config.: to set values to current printer

Load from File: to load values from file

Save to File: to save values to file

Close: to close CardPrinterConfig

(3) Card Printer Advanced Setup

You can set more values.

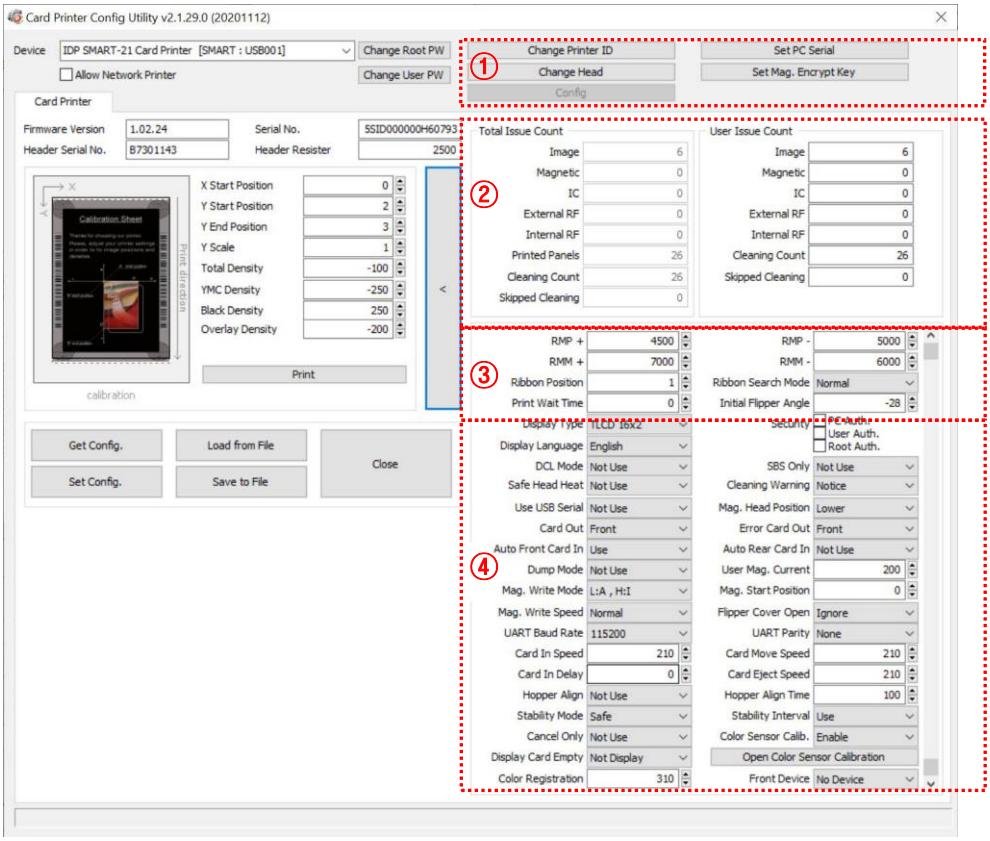


Figure 53 CardPrinterConfig – Card Printer Advanced Setup

① You can set Printer ID, PC serial, Print head and Magnetic encryption key.

Change Printer ID: When SMART-21 is used by SDK, you can set unique ID for SMART-21 printer regardless of whether it is connected by USB or what IP address is. It is useful to connect and use several printers. Default is “SMART”.

Set PC Serial: One of security function. You can use a printer with specific PC.

It is activated when you click “Set PC Serial” after “**PC Auth.**” of ④ is checked and rebooted. At that time, the specific information of used PC is saved to SMART-21 printer.

Change Head: When you replace thermal print head, you must change head information for optimal quality. Please change head serial number, resistor and type of head in the Change Head Dialog window after click “Change Head”.

Set Mag. Encrypt Key: One of security function. When you use SDK, you can encrypt magnetic stripe encoding data transmitted by USB. You can define and save the encryption key to SMART-21 using “Set Mag. Encrypt Key”.

② To show how many cards are issued with SMART-21 printer. “Total Issue Count” is the number of issued cards from factory shipment; “User Issue Count” is the number of issued cards from replacing head. When you replace a head, please initialize the number by ticking “Reset User Issue Count”.

③ To show ribbon motor management. SMART-21 recognizes ribbon color automatically and controls motor by ribbon remaining. “RMP+”, “RMP- “, “RMM+”, “RMM- “are necessary variables to control ribbon motor. Please do not change values for them as it affects card quality.

RMP+: Set the ribbon motor’s max torque value while printing when the balance is max.

RMP-: Set the ribbon motor’s min torque value while printing when the balance is min.

RMM+: Set the ribbon motor’s max torque value while moving when the balance is max.

RMM-: Set the ribbon motor’s min torque value while moving when the balance is min.

Ribbon Position: Set the ribbon arrangement position

Ribbon Search Mode: Set the ribbon Search method

Print Wait Time: Set the time from lifting down the print head to starting print

Initial Flipper Angle: Set the angle of flipper when card is out if the ‘Card Out’ is ‘Back’

④ Please refer as below for other values.

Display Type: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

UART Baud Rate: Set the speed of communication of Internal Serial port. It is used for the KIOSK model.

Security: There are several ways to set a security function for SMART-21.

PC Auth.: You can use a printer with specific PC. It is activated when you click “Set PC Serial”.

User/Root Auth.: You can set passwords for User and Administrator.

DCL Mode: When you use SDK and print cards with DCL mode, you do not need to install printer device driver.

SBS Only: Please enable it when you issue cards with software programed by SDK. This option disables printer device driver.

Safe Head Heat: Set not to print if the print head is overheated.

Cleaning Warning: Set to show the 'Do cleaning' message periodically

Use USB Serial: When SMART-21 is connected to USB, it transmits the USB serial number to PC. Default is the same number used by all SMART-21. Please set this option when you use multiple SMART-21 printers connected to 1 PC via USB. It enables unique serial numbers for each USB.

Mag. Head Position: SMART-21 can install the magnetic encoder on upper/lower side of a card. You can set it depending on the position of encoder.

Card Out: Set the way to eject cards.

Error Card Out: Set the way to eject error cards.

Auto Front Card In: Set to input a card automatically if the front card-in sensor detects a card**.** It is used for the KIOSK model.

Auto Rear Card In: Set to input a card automatically if the rear card-in sensor detects a card. It is used for the KIOSK model.

Dump Mode: Its records log data to inspect the operation of printer.

User Mag. Current: The default current value when the user selects to use the defined value when magnetic encoding

Mag. Write Mode: You can order the way how to encode magnetic stripe.

"L:A, H:I": encodes 3 tracks at once for LoCo card and encodes at twice by dividing 1,3 and 2 track for HiCo card.

Magnetic Start Position: Set the start position of magnetic stripe when you encode.

Magnetic Write Speed: Set the speed of magnetic encoding.

Flipper Cover Open: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

Card In Speed: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

Card Move Speed: set the speed of moving a card

Card Eject Speed: set the speed of ejecting a card

Card In Delay: Set the delay time after the card feed.

Stability Interval: Set the interval for printer operation stability.

Hopper Align: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

Hopper Align Time: THIS FEATURE IS NOT SUPPORTED IN SMART-21.

Stability Mode: Set the control method for printer operation stability. When set to "Safe", it slows down the speed however increases stability over "default".

Color Sensor Calib: Set whether to use color panel recognition as the calibration value of the sensor...

“Disable” is set to the default value.

“Enable” is set to the Open Color Sensor Calibration value.

Open Color Sensor Calibration: Measure the value of the color sensor.

Cancel Only: This function is not used in this model.

Display CardEmpty: This function is not used in this model.

Color Registration: To align the Y, M, and C panels for the best print results.

Front Device: This function is not used in this model.

4.2. Card Printer Test

Basically, Card Printer use standard printer device so you can be used same as general paper printer. In the case of magnetic stripe, contact, contactless encoder option, you will need to install appropriate driver and operate individually. Encoding operation will be controlled by “CARD PRINTER SDK”. You can test all feature of printer by Card printer Test. Card Printer Test program is developed by using “SMART Printer SDK”

(1) CardPrinterTest

When CardPrinterTest is run, all function can be tested individually.

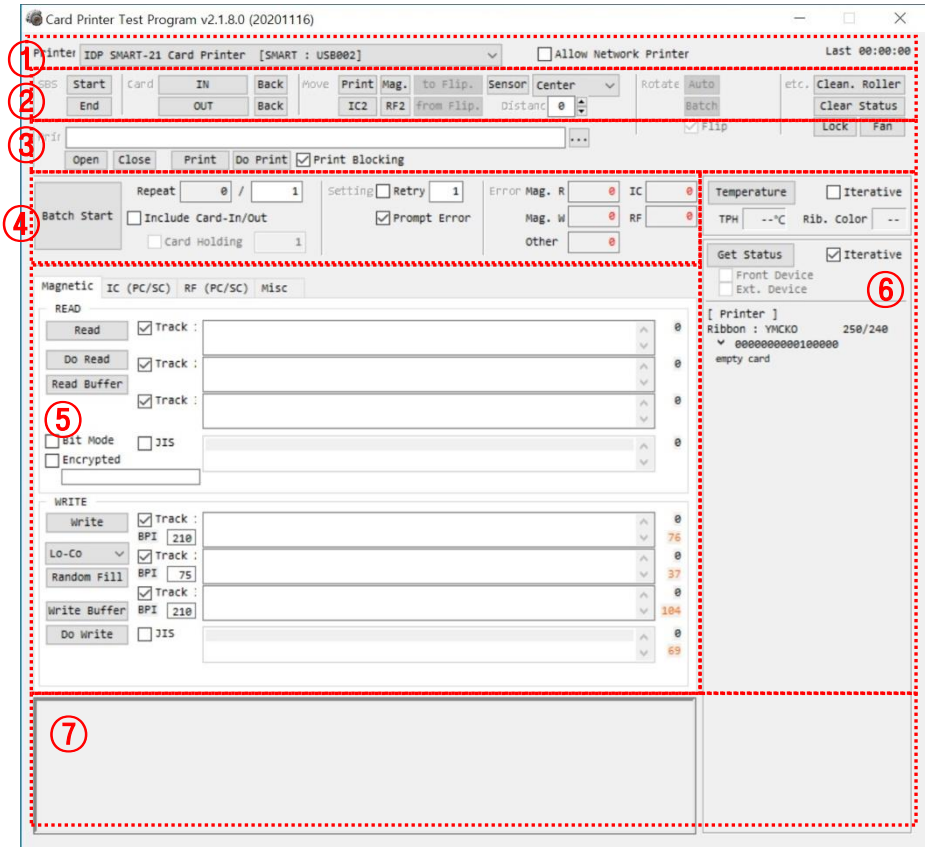


Figure 54 CardPrinterTest

① **Select Printer:** select printer to test. In the picture, “IDP SMART-21 Card Printer” is the Printer name, SMART is the Printer ID, and USB001 is the connected port.

② **Control:** To execute each step to test

③ **Print:** Print test with CSD file which is designed by SMART IDesigner program.

④ **Batch Start:** Repeat selected encoding test by "⑤ Encoding"

⑤ **Encoding:** Encode Magnetic Stripe, Contact Card, Contactless Card

⑥ **Printer Status:** Check printer status.

⑦ **Message:** Description of status by log.

(2) Select printer and control

When you execute CardPrinterTest, it will search connected printers by USB and Network automatically and SMART-21 printer connected to USB has higher priority. Other printers could be selected by pull-down menu. You can test all function with connected printer.

. Control is consisted by SBS (Step by Step), Move, Rotate, Etc. section and you can control printer by each step.

- **SBS**

  SBS is to operate SMART-21 printer in SBS(Step-By-Step) mode which you can control the printer using commands. In SBS mode, after printing data transmission, printing a card will be run only by clicking "DoPrint". It is the main difference between NORMAL mode and SBS mode. When you click "Start", SMART-21 is operated in SBS mode, and existing spooled data will be eliminated. To exit SBS mode, click "Stop".

- **Card**

  Card is to bring a card into printer and eject a card. "In" is to move a card from card slot to printer and "Out" is to move a card from printer to card slot.

- **Move**

  Move is to move a card to specific position in the inside of printer. "Print" is to move a card to the printing position, and "Mag." is to the magnetic encoding position. "from In" is to move a card from the card in sensor to where you define position, and "from Out" is to move a card from the card out sensor to where you define position.

- **Rotate**

THIS FEATURE IS NOT SUPPORTED IN SMART-21.

- **Etc**

  "Cleaning Roller" is to clean the roller by cleaning card automatically. "Use Log" is to display log in message space.

(3) Print

Print can be done through the CSD file which is designed by SMART IDesigner program. Following the steps in this section.

1. Click **"…"** button and select the CSD file.

2. Click **"Open"** button to prepare CSD file to print.

3. Click **"Print"** Button to move print data to spool. In the NORMAL mode, click "Print" button to print a card, but in the SBS mode, "Print" button to transmit a printing data from PC to printer and wait for printing. Therefore, you must click "DoPrint" to print in SBS mode. This function is for detail control of printer.
4. Click **"Close"** button to close CSD file.

(4) Batch

Batch is to repeat encoding/decoding test continuously. In the Repeat, you input the number of repeat and click "Batch Start", then the test is run as many times as the number of set. When you check **"Include Card In/Out"**, each time the printer brings a card from card slot and perform an encoding test and eject the card. So, cards should be entered manually as many times as the number of sets. But if not, encoding test will be done only by one card. At that time, if there is no card in the printer, the printer brings a card from card slot and repeat the encoding test on the card, and if there is a card in the printer, the encoding test is performed on the card repeatedly. **"Card Holding"** is activated when "Include Card In/Out" is ticked. When "Card Holding" is ticked and the repeat number is set, the printer repeats the encoding test as many times as the number of sets in the "Card Holding" without ejection. When it is completed, the printer ejects the card and brings a new card into the printer from card slot and starts testing.

In the Setting, **"Retry"** is to retry the encoding test when the error occurred. **"Prompt on Error**" is to display Pop up Message when the error occurred. If not, Error number will be counted without message. The number of errors is displayed at Error section**.**

(5) Encoding

Magnetic: Magnet Stripe Encoding

“Read” is to read and display the data from magnetic stripe card. It is composed of “Do Read” and “Read All Buffer” and runs “Do Read” and “Read All Buffer” sequentially.

“Do Read” is to read the data from magnetic stripe card and store the data in the buffer.

“Read All Buffer” is to transmit the date stored in the buffer to PC. If the track number is ticked, the data of the ticked track is only transmitted to PC.

“Write” is to write the data to the magnetic stripe. It is composed of “Write All Buffer” and “Do Write” and runs “Write All Buffer” and “Do Write” sequentially.

“Write All Buffer” is to transmit the data to the buffer.

“Do Write” is to write the data stored in the buffer to the magnetic stripe of card. You can choose the magnetic foil type (LoCo or HiCo) and the track of magnetic stripe. **“Random Fill”** is to create a random magnetic encoding data for testing.

Batch process repeats the following steps sequentially, **Card “IN” → Move “Mag” → Magnetic “Random Fill” → Magnetic “Write” → Magnetic “Read” → Card “OUT”**.

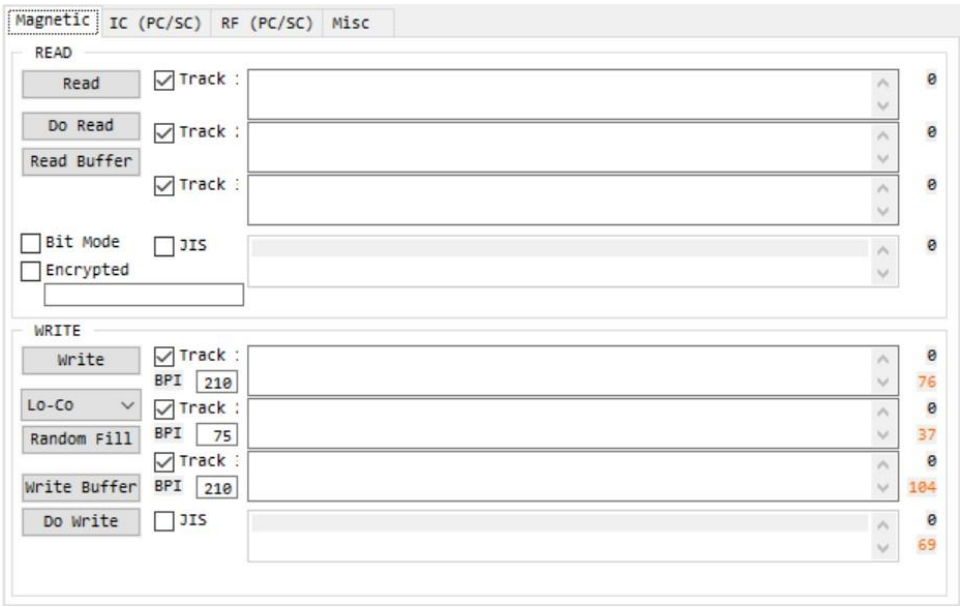


Figure 55 Magnetic stripe encoding

(6) Printer status

“Get Temperature” is to get and display the temperature of Thermal Print Head. When the “Realtime Check” is ticked, it displays the current temperature of Thermal Print Head in real time.

“Get Status” is to get and display the printer status.

Please refer to the ‘SMART SDK manual’ for the status code.

4.4. Firmware update

When you run the CardPrinterFirmware, you can see the pop-up window.

(1) CardPrinterFirmware Menu

Device: Select the local printer that you want to upgrade.

Card Printer / Flipper / Laminator: Select the device you want upgrade.

Device Version: Displays the current firmware version of selected printer.

Binary File: Click “Browse” button and select new firmware file to update.

Manual Update: It is used when you want to update manually.

Update: Updates automatically. In generally, we recommend updating automatically.

Close: Exit.



Figure 56 Run CardPrinterFirmware

Color Sensor Calibration: To re-adjust the measured value of the color sensor.

Message: It displays information of updating.

(2) Ready for Firmware Update

- Select the printer to update the firmware on the ‘Device’ list.
- Select the device to update the firmware Printer tab.
- Click “Browse” and select the new firmware

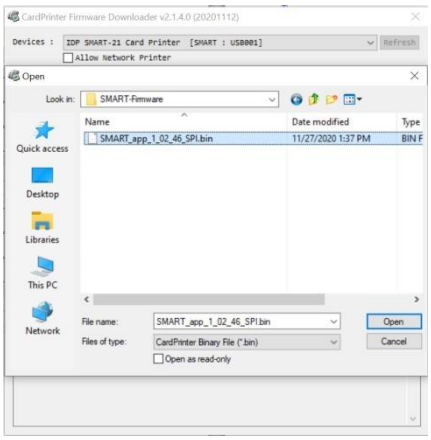


Figure 57 Select Firmware

(3) Firmware Update

- Click “Update” button to upgrade automatically, then the printer is upgraded after rebooting.
- In case there are some problems in the automatic upgrade, you click “Manual Update” and can see the pop-up widow as below picture. It shows procedure of manual upgrade. You can upgrade manually according to this procedure.

(Caution: Please do not close upgrade dialog box until it is completed successfully and do not turn off the printer.)



Figure 58 Update Firmware

5. Troubleshooting

5.1. Error Message

SMART-21 printer shows the error message displayed on the Watchman program of the Windows tray when it occurs.

The following shows the error message on your SMART Printer. For checking a status of printer, please use a CardPrinterTest or CardPrinterDiagnostics in the Utilities folder.

No	Watchman Message	Description and Countermeasures
1	Card In Error	Fail to move a card from the card slot to the printer inside. -. Clean the cleaning roller
2	CardMove Int Err	Fail to move a card in the printer. -. Remove a card if the ribbon is attached -. Check the rollers and cards, and clean them if they are polluted -. Check the operating state of the card feeding rollers and sensors
3	CardMove Ext Err	Fail to move a card between printer and another module(flipper/laminator) -. Check the rollers and cards, and clean them if they are polluted -. Check the operating state of the card feeding rollers and sensors
4	Card Out Error	Fail to discharge a card after printing, encoding or laminating. -. Remove a card if the ribbon is attached -. Check the rollers and cards, and clean them if they are polluted -. Check the operating state of the card feeding rollers and sensors
5	TPH UpDown Error	The Head Up/Down Motor or Sensor do not work correctly in printing or booting up -. Check the operating state of the Head Up/Down Motor and Sensor. -. Check the status of the mirror sticker in the Head Up/Down Gear.
6	IC UpDown Error	THIS FEATURE IS NOT SUPPORTED IN SMART-21.
7	Ribbon Seek Err	The printer cannot search the ribbon panel in printing or booting up

		-. Check the operating state of the Ribbon Motor -. Check the operating state of the ribbon encoder sensor and gears -. Check and clean the Color In/Out Sensor -. Check the operating state of the color in/out Sensor
8	Ribbon Move Err	The printer cannot wind the ribbon in printing or booting up. -. Check the operating state of the Ribbon Motor -. Check the operating state of the ribbon encoder sensor and gears
9	MAG R/W Error	Fail to read or write the magnetic stripe. -. Check the surface and direction of magnetic card -. Check the coercivity of magnetic card and encoding configuration -. Check the rollers, encoder and cards, and clean them if they are polluted
10	MAG T1 Error	Fail to read a track 1 of the magnetic stripe. -. Check the surface and direction of magnetic card -. Check the coercivity of magnetic card and encoding configuration -. Check the rollers, encoder and cards, and clean them if they are polluted
11	MAG T2 Error	Fail to read a track 2 of the magnetic stripe. -. Check the surface and direction of magnetic card -. Check the coercivity of magnetic card and encoding configuration -. Check the rollers, encoder and cards, and clean them if they are polluted
12	MAG T3 Error	Fail to read a track 3 of the magnetic stripe. -. Check the surface and direction of magnetic card -. Check the coercivity of magnetic card and encoding configuration -. Check the rollers, encoder and cards, and clean them if they are polluted
13	Printing Error	Error occurs while printing -. Check a card is jammed -. Check usage of a genuine ribbon and cards -. Check the rollers, encoders and cards, and clean them if they are polluted
14	Init Error	Error occurs while initializing -. Check the status of installation of ribbon.

15	DeviceCon Error	THIS FEATURE IS NOT SUPPORTED IN SMART-21.
16	Lami Error	THIS FEATURE IS NOT SUPPORTED IN SMART-21.
17	Flipper Error	THIS FEATURE IS NOT SUPPORTED IN SMART-21.
18	Ribbon Zero	All ribbons are used -. Install the new ribbon after purchasing it in the place of purchase
19	RibbonNotFound	Ribbon is not installed or not searched -. Install a ribbon if not -. Check usage of a genuine ribbon
20	TPH Not Found	Thermal Print Head is not installed or not recognized -. Check the print head installation -. Contact the place of purchase
21	TPH Over Heat	Thermal Print Head is overheated -. Lower the temperature when the temperature of circumstance is too high -. Take a stop for 10 minutes and print again. -. Contact the place of purchase if this message is shown regularly
22	Invalid Data	Error occurs when the abnormal printing data is transmitted. -. Replace the USB cable USB -. Change the USB port in the PC -. Reinstall the printer driver
23	Wrong Password	The password is not correct -. Input the correct password -. Contact the place of purchase if you forget the password
24	SetCommandFail	Failed to execute a command of the printer -. Replace the USB cable USB -. Change the USB port in the PC -. Turn off/on the printer
25	Spool Full	The printing data is full in the spooler -. This message disappears after printing all data to send -. Turn off/on the printer if the spool data is full without printing

5.2. Cleaning the printer

To maintain the best condition of SMART-21 printer, you must clean the printer periodically. If you use the exclusive long cleaning card as the picture, you can clean the printer easily. For purchase the exclusive long cleaning card, ask to SMART-21 printer provider.



Figure 59 Exclusive long cleaning card for SMART-21 printer

If the exclusive long cleaning card is ready, click the “Clean Printer” in the service tab of SMART-21 printer driver. After click, Clean Printer program to clean the printer is run.

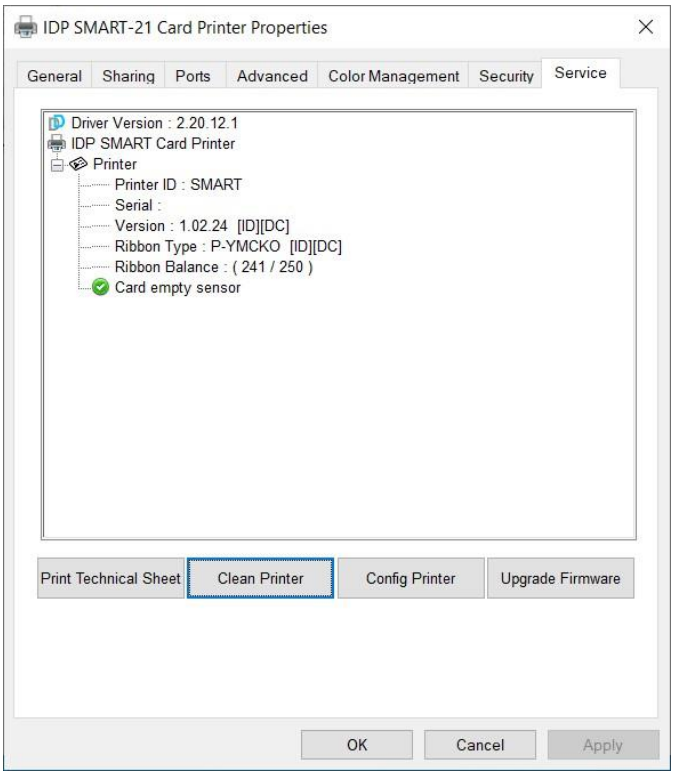


Figure 60 Printer cleaning start

Step 1. Connect the SMART-21 printer to PC and turn it on and prepare the exclusive long cleaning card.

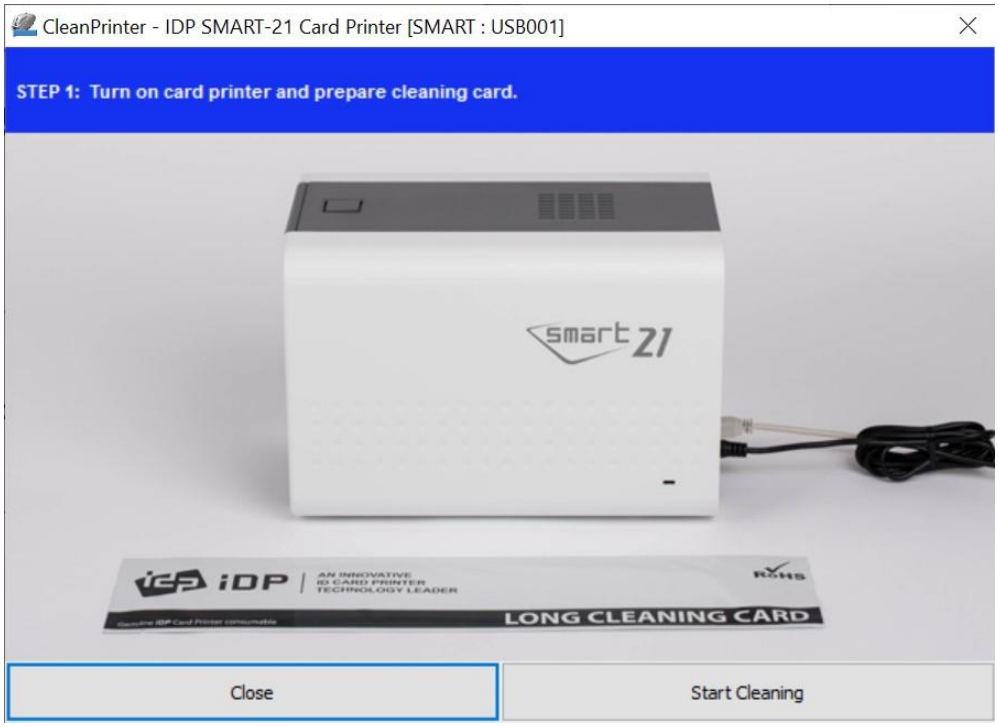


Figure 61 Printer cleaning Step 1

Step 2. Open the hopper and top cover and remove the card and ribbon cartridge.

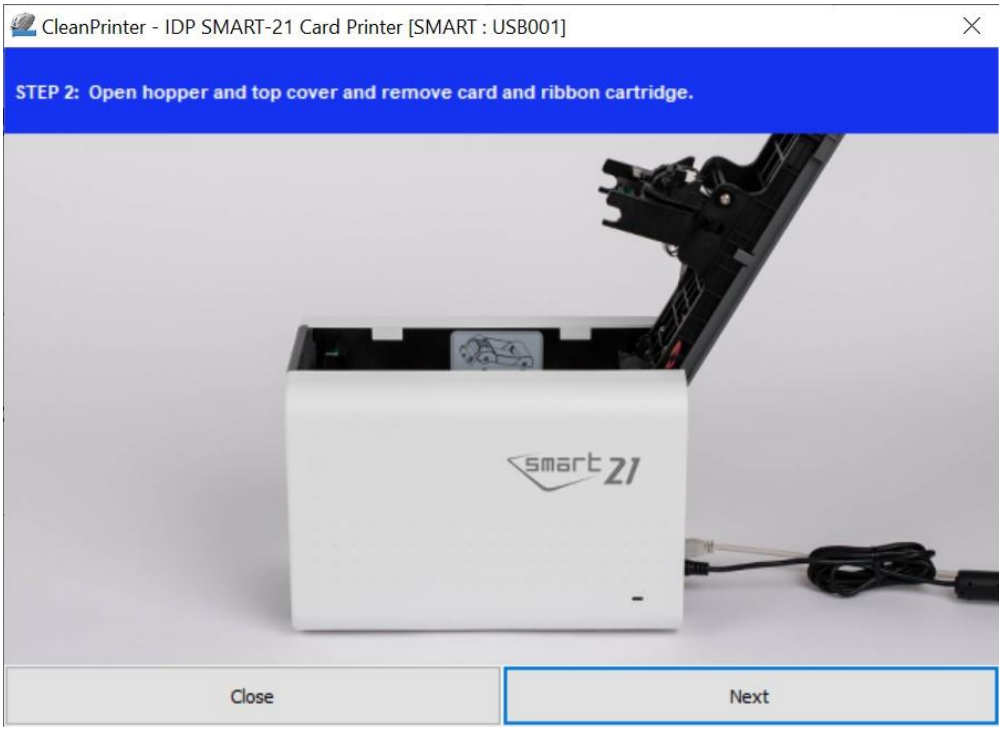


Figure 62 Printer cleaning Step 2

Step 3. Insert the exclusive long cleaning card into the printer through input hopper. When the exclusive long cleaning card is inserted to the cleaning roller, it will be move automatically. It is normal that the exclusive long cleaning card is inserted to the ends and rollers are moving to clean.



Figure 63 Printer cleaning Step 3

Step 4. Close the top cover to clean the Thermal Print Head and the printing roller. When the top cover is closed, cleaning card will be moving back and forth to clean.



Figure 64 Printer cleaning Step 4

Step 5. Wait until the cleaning is completed. When the cleaning is completed, the exclusive long cleaning card will be ejected automatically as the picture.



Figure 65 Printer cleaning Step 5

Step 6. Remove the exclusive long cleaning card and install ribbon cartridge into the printer.



Figure 66 Printer cleaning Step 6

5.3 TPH (Thermal Print Head) replacement

1. Check the serial number and the resistance of new Thermal Print Head as the Picture.

TPH type: A = KEE, B = KPE

Serial No.: see the red box.

TPH resistance: see the green box.

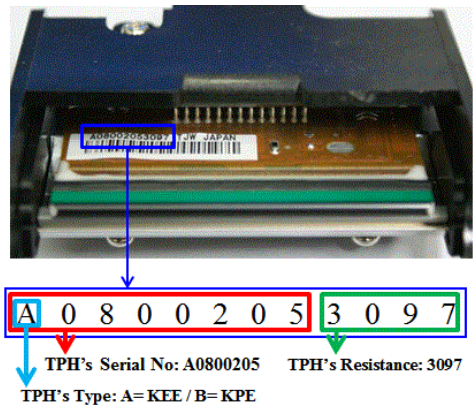


Figure 67 Thermal Print Head

2. Set up the new Print Head's configuration using CardPrinterConfig program.

Step1: Run 'CardPrinterConfig' in Utilities of the Utilities package and click expansion button.

Step2: Click "Change Head" in the extended setup.

Step3: Input the Print Head's Serial No., Resistance and Type (choose KEE or KPE) on the Print Head's label and click "OK".

Step4: Click "Set Config" to set the new Print Head's configuration.

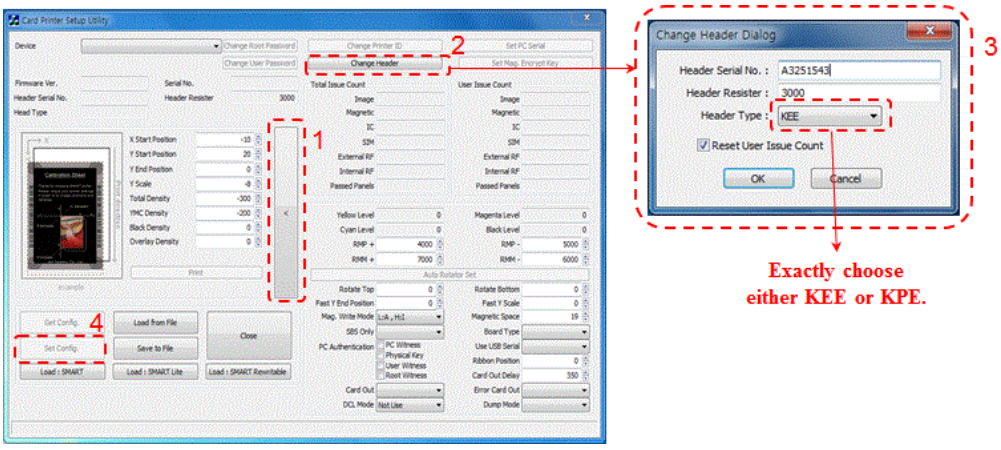


Figure 68 Print head setup

4. Replacing the new Print Head

Step1: Remove the old Print Head from the top cover.

(1) Turn off the printer and open the top cover.

(2) Hold the Print Head and press the locked hook, then the Print Head is disconnected.

(3) Disconnect the Print Head from print head wire carefully.

(Caution: Print Head is possible to HOT.)

Step2: Installing the new Print Head

(1) Connect new Print Head to the print head wire.

(2). Put the new Print Head on the Shift and pull it up until be locked.

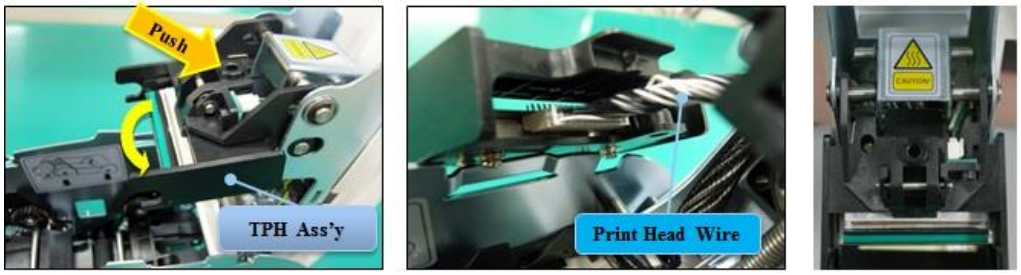


Figure 69 Print head replacement

5. Setup the print position and the color density.

After installing the new Print Head, you must reset the print position and the color density using CardPrinterConfig utility. Refer to “4.1.2 Default setting”

6. Calibration of Print Head Angle

To get the best print quality, the Print Head should be located vertically with card surface.

If print quality has the problem, it could be caused by print head angle.

Through Adjusting print head angle by screw (red mark in the right picture), you could make good quality of print.

(Use the appropriate screwdriver to adjust and turn the screw by 90 degrees at a time.)

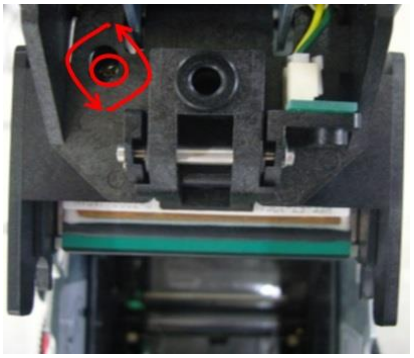


Figure 70 Print head angle

5.4. Card movement

5.4.1. Cards cannot enter into the printer from input hopper.

- **Non-standard cards or bad cards.**
  Change the cards. You can use only ISO CR-80 card (54mm x 86mm).
- **Card thickness control lever is set improperly.**
  Regulate the card thickness control lever to fit the current card thickness.
- **Bad card array.**
  Array the cards again and put them on input hopper as section 2.4 in this manual.
- **Cards have static and moisture.**
  Remove the moisture or static**.**

5.4.2. Card Transfer Error occurs when the ribbon is coiled around the transfer roller or the printing roller.

Open the top cover and remove the card and the coiled ribbon from SMART-21 printer using front LED buttons. If this problem occurred frequently, check the below things.

- **Non-standard cards or bad cards.**
  Change the cards. You can use only ISO CR-80 card (54mm x 86mm).
- **The transfer roller or the printing roller is contaminated with the dust and dirt**

  Remove the dust and dirt with the cleaning kit as section 5.2
- **Wrong printing position setting.**
  Please contact the local supplier
- **When operating temperature and humidity is out of the acceptable operating limit of the printer.**
  Adjust the operating environment of the printer.

5.4.3. An Error occurs while the card is being transferred.

First, check the Error message on the Watchman program.

Open the top cover and remove the card by LED buttons.

If this problem occurs frequently, check the followings.

- **Non-standard cards or bad cards.**
  Change the cards. You can use only ISO CR-80 card (54mm x 86mm).
- **Printer setting is changed or is not proper.**
  Please contact the local supplier.

- **The transfer roller or the printing roller is contaminated with the dust and dirt.**

  Remove the dust and dirt with the cleaning kit as section 5.2.

- **The card surface is contaminated with the dust and dirt.**

  Check the card surface and remove the dust and dirt and try again. If this problem occurs again, retry with new card.

5.5. Printing quality

5.5.1. Not printed or wrong colors printed spot.

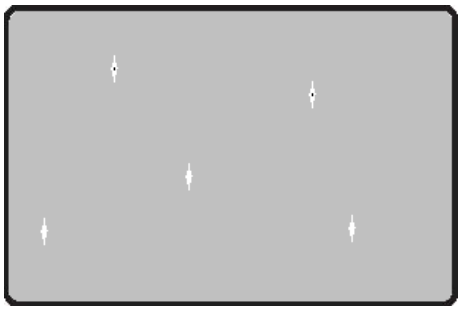


Figure 71 Printing quality trouble 1

- **The card surface is contaminated with the dust and dirt.**
  After checking the card, change it to another card**.**
- **The cleaning roller is contaminated with the dust and dirt.**
  Check the cleaning roller. If there is much dust, change the cleaning roller to the new one.
- **Much dust in the printer.**
  Clean the inside of the printer with the cleaning kit.

5.5.2. Not printed horizontal line.



Figure 72 Printing quality trouble 2

- **The ribbon cartridge is installed improperly.**
  Check the ribbon cartridge installation state and whether the ribbon has wrinkles.
- **The printer head is contaminated with the dust and dirt.**
  Clean the printer head with cleaning kit.
- **The printer head is damaged.**
  Please contact the local supplier to replace the printer head.

5.5.3. Unclear or not uniform print.

- **Uneven or bad card surface.**
  Change the card.
- **Too high or low setting of the color density.**
  Please contact the local supplier. The color density default of your printer needs to be changed.
- **The printer head is contaminated with the dust and dirt.**
  Clean the printer head with cleaning kit.

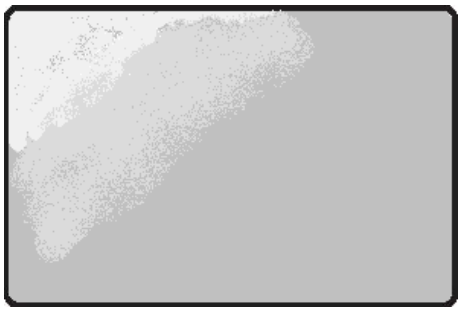


Figure 73 Printing quality trouble 3

5.5.4. Not aligned color print.

- **Non-standard cards or bad cards.**
  Change the cards. You can use only ISO CR-80 card (54mm x 86mm).
- **Uneven or bad card surface.**
  Change the card.
- **The transfer roller or printing roller is contaminated with the dust and dirt.**

  Clean the rollers with the cleaning kit as section 5.2.
- **Worn-out printer.**
  Please contact the local supplier.

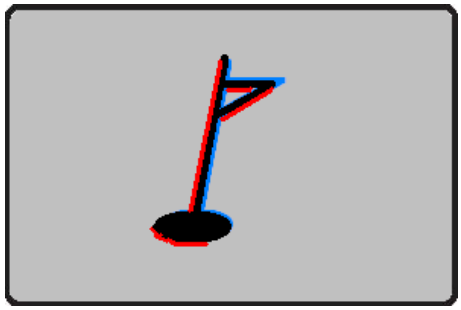


Figure 74 Printing quality trouble 4

5.5.5. Unplanned color print.

- **Non-standard cards or bad cards.**
  Change the cards. You can use only ISO CR-80 card (54mm x 86mm).
- **Uneven or bad card surface.**
  Change the card.
- **The transfer roller or printing roller is contaminated with the dust and dirt.**

  Clean the rollers with the cleaning kit as section 5.2.
- **Worn-out printer.**
  Please contact the local supplier.



Figure 75 Printing quality trouble 5

5.6. Magnetic stripe encoding

5.6.1. Magnetic encoding error.

- **The magnetic head is contaminated with the dust and dirt.**

  Clean the magnetic head with the cleaning kit.

- **The magnetic encoding data is not transmitted, or the wrong data is transmitted.**
  Check the setting of the program and the driver and the magnetic encoding data you transmitted.

- **The card is not magnetic card, or inserting direction is wrong.**
  Change the card or the direction.

- **Bad magnetic stripes on the card.**
  Change the card.

5.7. General operation

5.7.1. Ribbon snapped during printing.

Open the top cover and take out the cartridge. After putting the snapped pieces on together, install the cartridge again. Check the followings if this kind of problem occur frequently**.**

- **Non-standard cards or bad cards.**
  Change the cards. You can use only ISO CR-80 card (54mm x 86mm).

- **Too high or low setting of the color density.**
  Please contact the local supplier. The color density default of your printer needs to be changed.

5.7.2. Watchman Message “Ribbon Not Found”

Open the Top Cover and check the status of ribbon installation. If it occurs frequently, check the followings.

- **Not genuine ribbon.**
  Change to the genuine ribbon.

- **Ribbon is consumed.**
  Printing is not possible if ribbon is used up. Change the ribbon.

- **Snapped ribbon.**
  Open the top cover and take out the cartridge. After putting the snapped pieces on together, install the cartridge again.

5.7.3. Printer does not operate even if the printing data has been transmitted. Check the following.

- **Printer power off.**
  Check the power. Turn on the printer power.
  Check the printer adaptor whether it is connected with a socket and the printer.
- **Bad power adaptor.**

  Please contact the local supplier for replacement of the adaptor.
- **The printer driver is "Offline".**

  Change the printer driver to "Online".
- **The printer's USB cable is disconnected, or the connection is bad.**
  Check the cable's connection between PC and the printer.
  If not good, make the USB cable connection again.
- **Bad USB cable.**
  Change the USB cable.
- **The printing is operated with another printer driver.**
  Select the correct SMART-21 printer driver again.
- **Wrong USB port setting of the printer driver.**
  Check the port setting of the printer driver and change the port setting.
- **No ribbon in the printer or error occurred.**
  Install ribbon in the printer or resolve the error.
- **Too long power or USB cable (more than 1.5M).**
  Use the cable provided with the printer.
- **PC's USB port is down:**

  Reboot your PC.

6. Specification

Model		SMART-21S	SMART-21R
Printing	Print Type	Dye-Sublimation	Thermal Transfer
	Print Area	Edge to Edge	
	Resolution	300dpi (Color & Mono) / 600 & 1200dpi (Mono only)	300dpi
Card	Card Feeding	Manual	
	Card Size	ISO CR80	
	Card Thickness	0.38mm (15mil), 1.0mm (40mil)	
	Card Type	PVC, PET, Composite PVC	Rewritable Thermochromics Material
Printing Speed	Monochrome	5 sec./card (720 cards/hour)	Max. 12 sec./card (300 cards/hour)
	YMCKO	Max. 23 sec./card (156 cards/hour)	_
System	Memory	64MB RAM	
	Control Panel	1 LED Button	
	Supported Platforms	MS Windows 7/ 8/ 10, Mac OS, Linux	
	Communication	USB	
	Power Supply	Free Voltage (AC 100/220V, 50~60Hz)	
	Power Consumption	48	
	Temp. / Humidity	15~35℃ / 35~70%	
Dimensions	Millimeter (WxLxH)	168 x 259 x 179	168 x 259 x 179
	Inch (WxLxH)	6.6 x 10.2 x 7.0	6.6 x 10.2 x 7.0
Weight	Kg / Lbs	2.7 / 5.95	2.7 / 5.95
Encoding Options	Magnetic	ISO 7811 (Track I, II, III Read/ Write, HiCo/ LoCo), JIS II	
Certifications		CB, CE, FCC, KC, CCC	

Specifications and availability may change without notice.

- **RFID (13.56MHz) Usage**

  The RFID Tag is used for the security and the recognition of the ribbon. To get the optimized printing quality on the printed card, the genuine ribbon of IDP should be used to print cards by using SMART printer. SMART printer can recognize the genuine ribbon by reading the encoded information on the RFID Tag of the ribbons. To support user's various requirements for printing cards appropriately, many kinds of ribbons should be provided, and SMART printer should distinguish the type of installed ribbon. To distinguish the installed ribbon type correctly, SMART printer reads the encoded information on the RFID Tag of the ribbons. According to the installed ribbon type and the ribbon supplier, the printer driver of SMART printer can select the color profile and create the printing data.

FCC Information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC notification to users

This equipment has been tested and found to comply with the limits for a CLASS B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference, the user is encouraged to try to correct the interference by consulting with a dealer or an experienced technician for technical assistance.

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.