

P25 Printer Device Manager User Guide



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P25 Device Manager User Guide

The P25 Device Manager is intended for developers looking to integrate the P25 printer into their application. Install and run the P25 Device Manager software on a personal computer to manage P25 firmware and demonstrate the supported Print commands.

The application can work on Windows 2000, Windows XP, Windows Vista & Win7 edition. It provides the following features:

- **Firmware Loader** - Update the firmware and resource data to the P25 printer.
For example, P25 firmware, font files, etc.
- **Print Demo** - Print commands can be edited, combined, and then sent to the P25. The P25 will print according to the ESC control language.
- **MSR Demo**- Swipe the card on a P25-M and see the card information.
- **IMG_CMD** - Demonstrate an image file (bmp file), the bmp file can be converted to commands directly and send to the P25. For example, the data of logo can be embedded to the application and the P25 will print the logo.
- **IMG_RES** -Generate an image file (pic/ap2 file) which can contain several bmp files. The P25 can print different image depending on the commands sent to it.
- **DUKPT** – Download and manage the DUKPT Keys in the P25

1 Installation and Launch

1.1 Install the P25 Device Manager

- a. Download the P25 Device Manager setup program from www.bluebamboo.com/support
- b. Double-click the P25 Device Manager setup program as shown in Figure 1, and then follow the installation instructions as shown in Figure 2 to Figure 8.



Figure 1



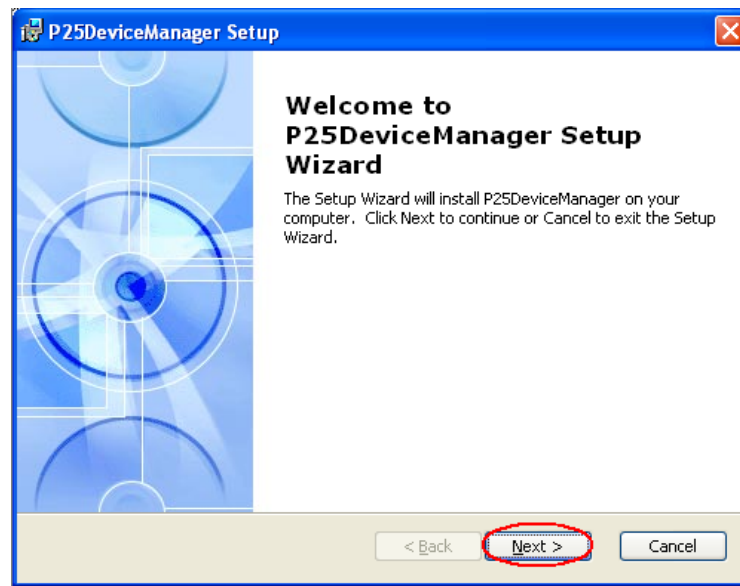


Figure 2

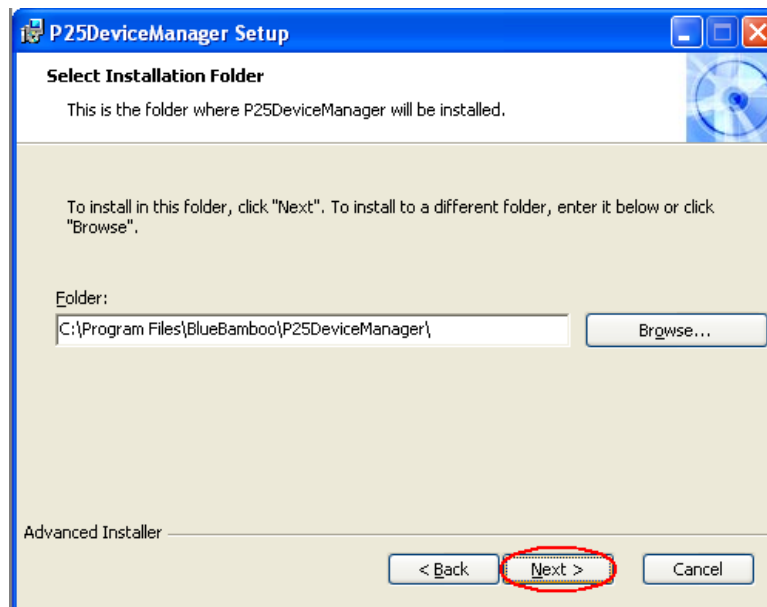


Figure 3



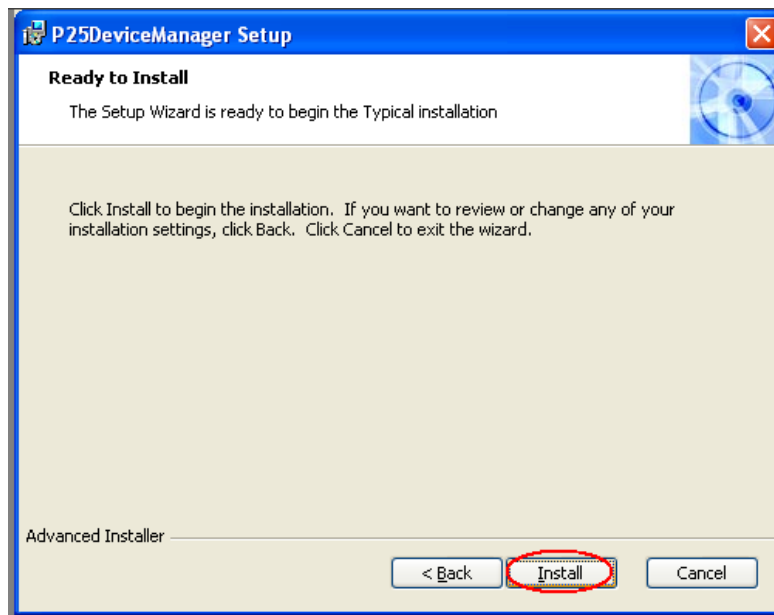


Figure 4

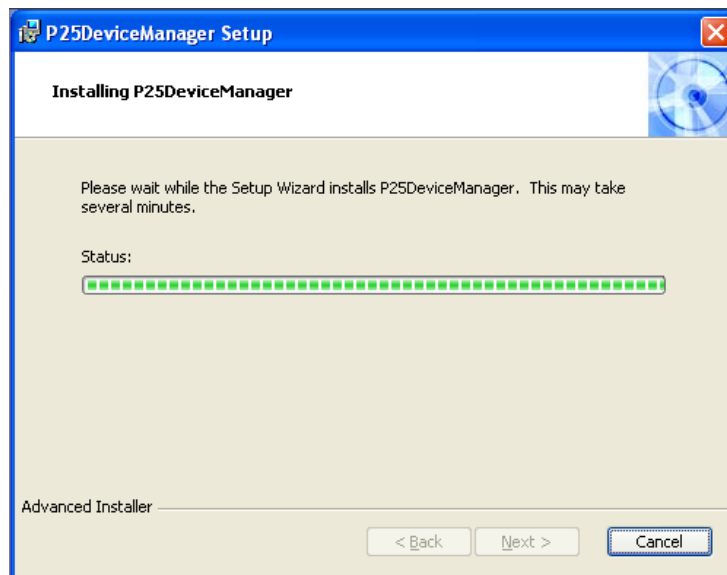


Figure 5



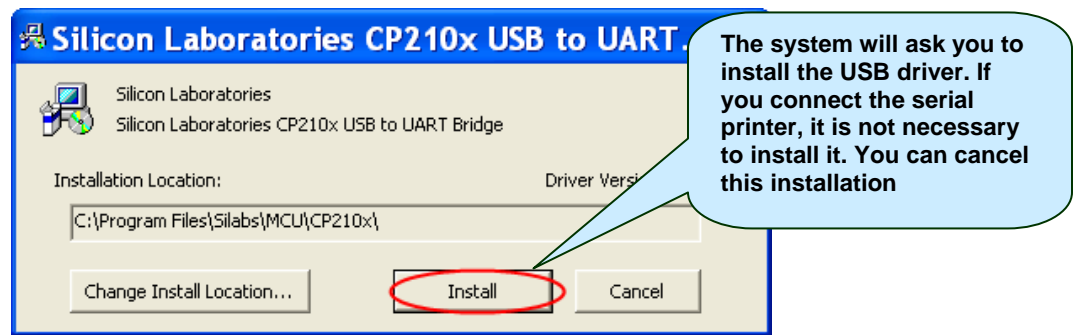


Figure 6

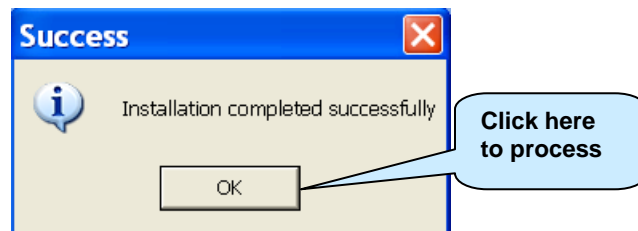


Figure 7

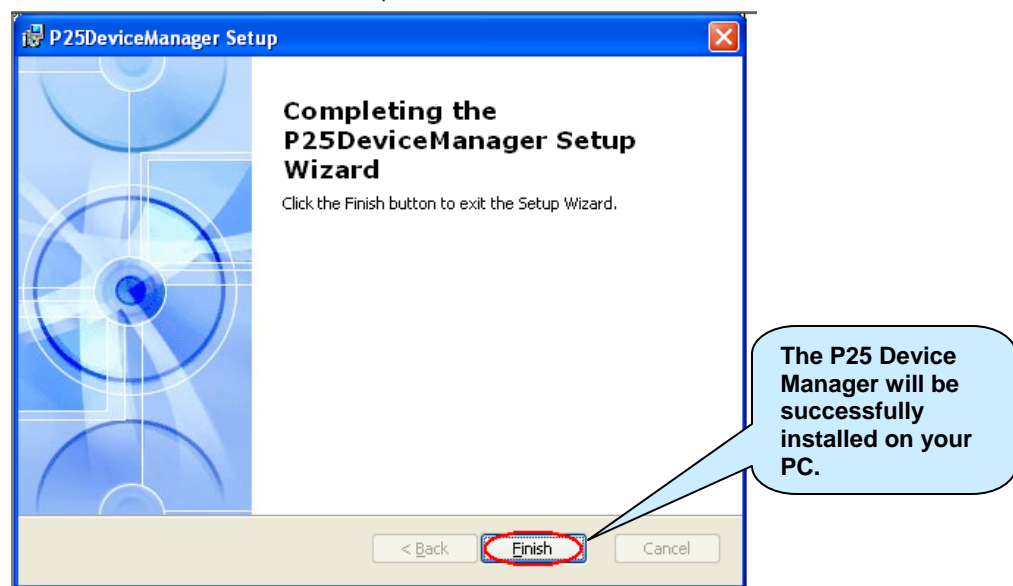


Figure 8

Note: To install the P25 Device Manager successfully on Windows 7 edition, please ensure you have the admin right to install the software application on the computer.

1.2 Launch the P25 Device Manager

Click the following icon as shown in Figure 9 on the desktop or from the **Start** menu. After the application is launched, see Figure 10.



Figure 9

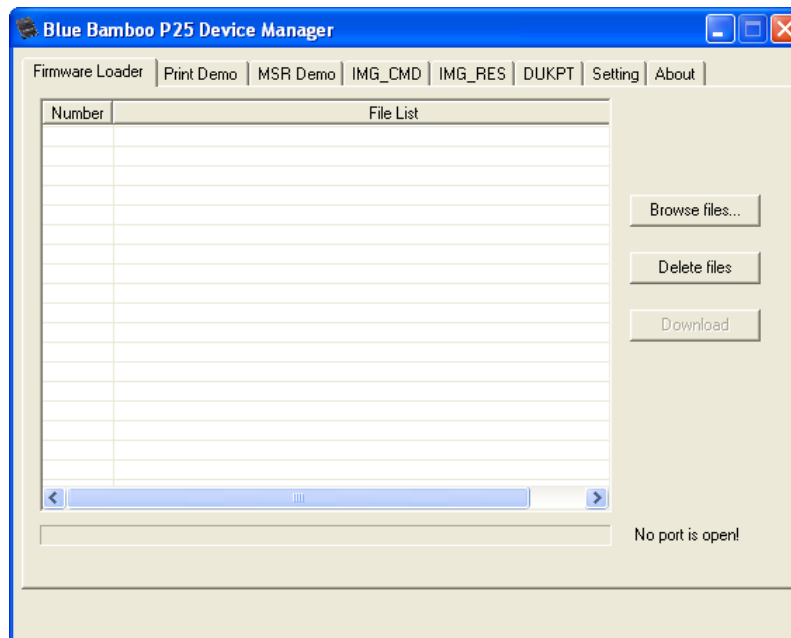


Figure 10

2 Setting

2.1 Set the correct com port.

Before using the P25 Device Manager, please make sure you have already connected your printer with PC.

- Open the P25 Device Manager, there will be a message at the bottom right corner to show that no port is open as Figure 11. You need to select the correct communication port and open it first.

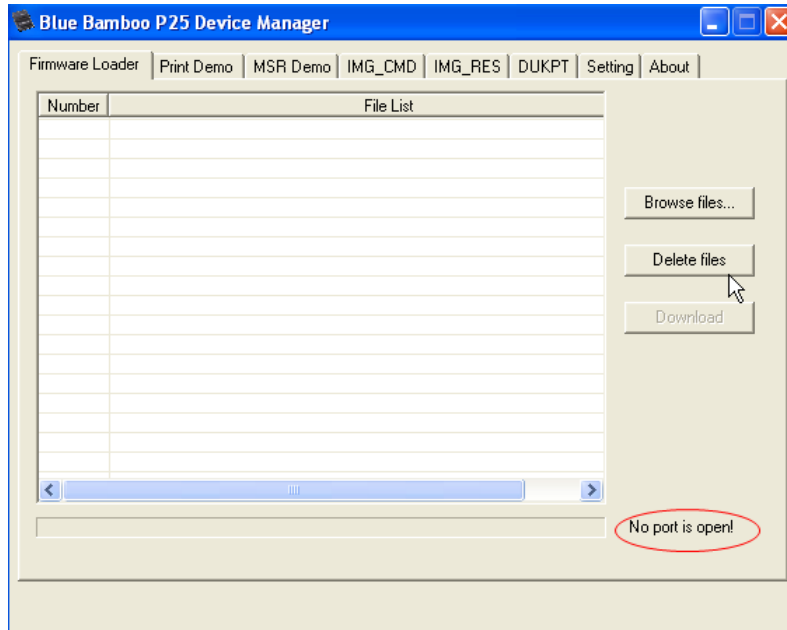


Figure 11

- Click **Setting** tab, the setting page appears as shown in Figure 12.

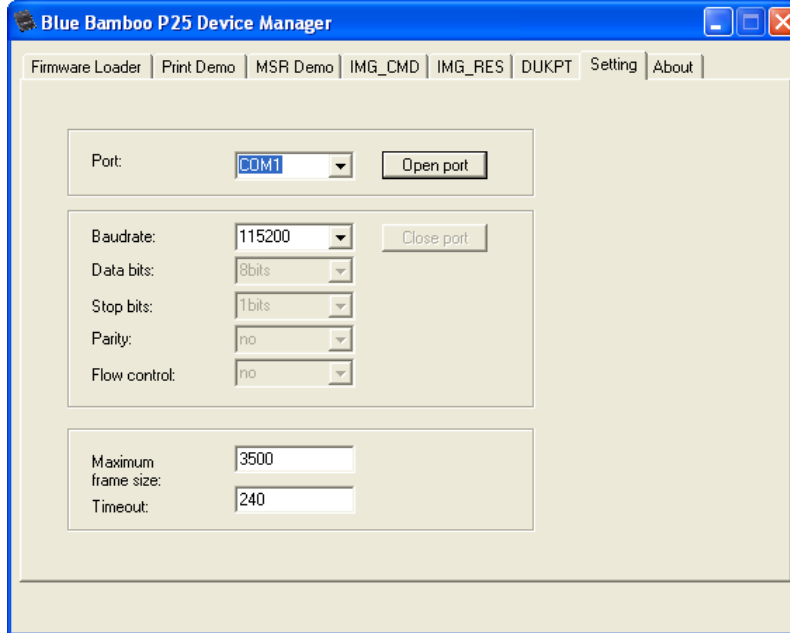


Figure 12

- Open the drop-down menu under **Port**, and select the corresponding **Com Port** associated with the com port connected with P25. Then click **Open Port** button to open the correct communication port.

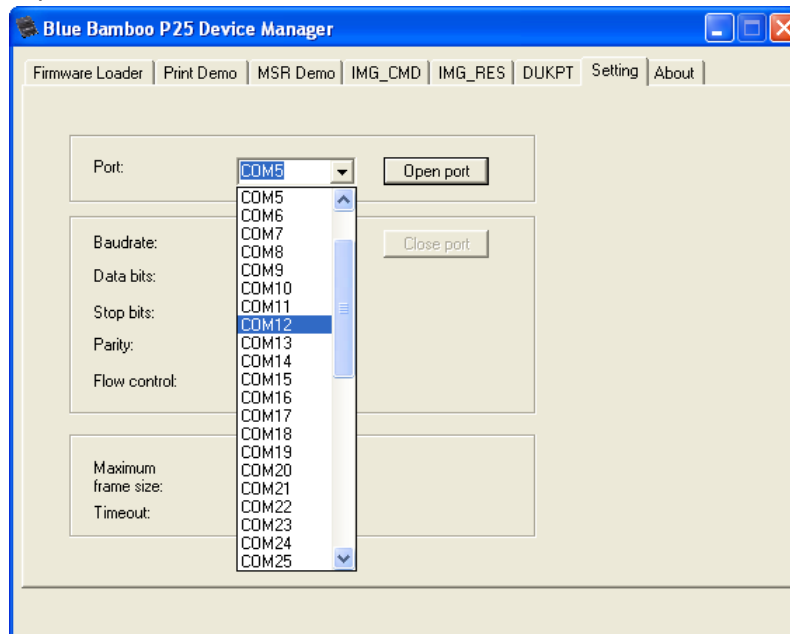


Figure 13

Note:

- If the printer is connected to the PC via USB or serial cable, to find the port number in your PC system, please go to the Windows Device Manager.

(Please refer to Appendix A about where to find the Windows Device Manager)

Open **Ports** and check the correct port number.

For a serial printer, the port number is the one which the printer connect with, as shown in Figure 14

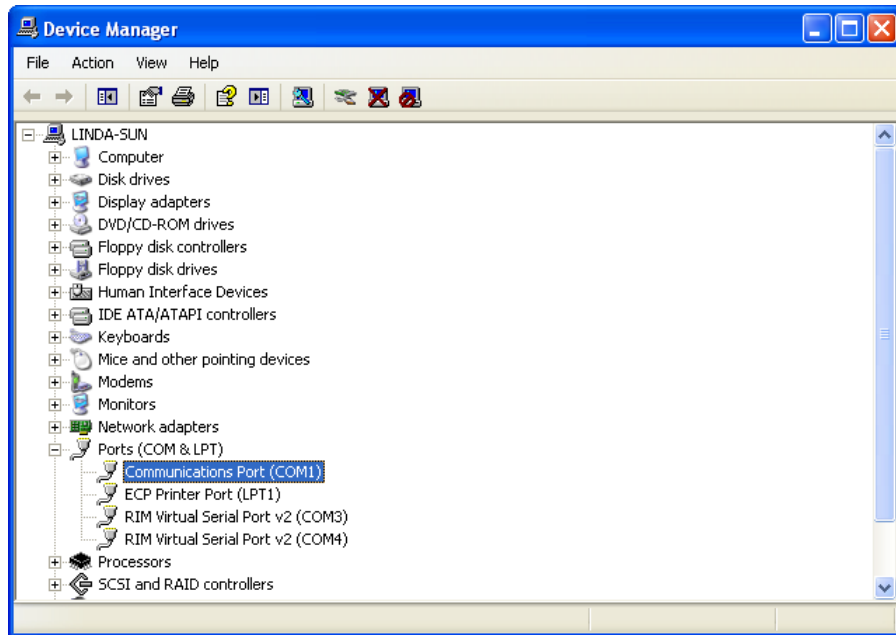


Figure 14

For an USB printer, the port number is the one whose name is **Silicon Labs CP210x USB to UART Bridge**, as shown in Figure 15.

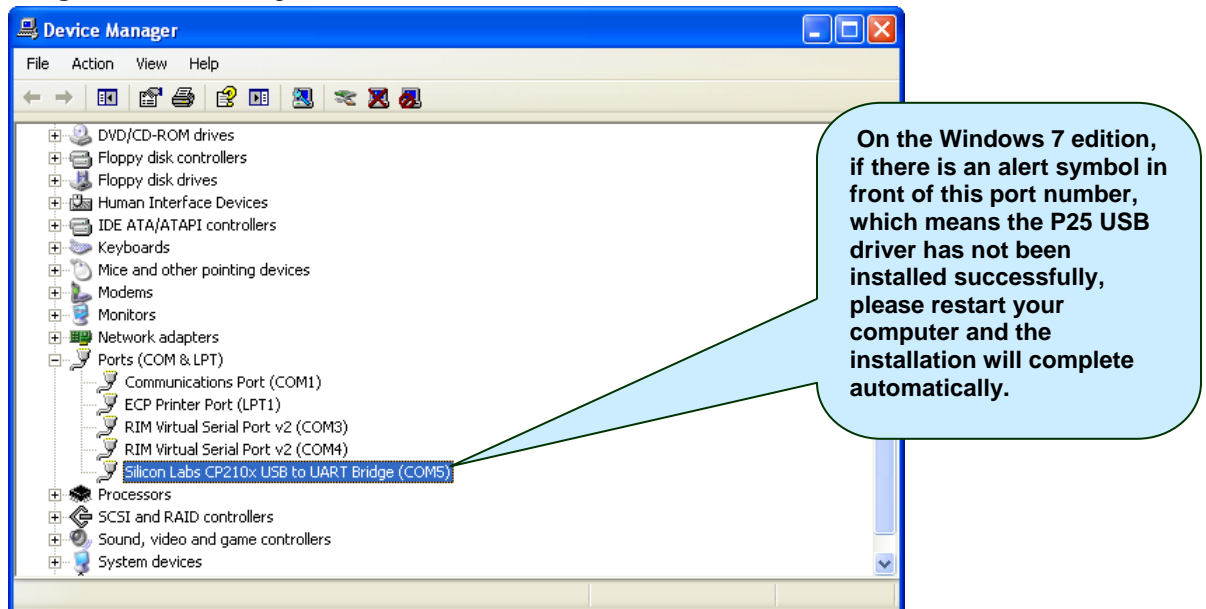


Figure 15

b. If the printer is connected to the PC via Bluetooth, the associated port number will be shown at the bottom right corner of your PC desktop as soon as the connection is established. (Refer to Appendix B→ Step f)

2.2 Set the other parameters.

If necessary, you can change the other parameters such as Baud rate, Maximum frame size, Timeout in their corresponding fields. The maximum Frame size can be set from 1 to 3500 bytes, the timeout can be set from 1 to 240 seconds. It is recommended that you keep them as default value as shown in Figure 16.

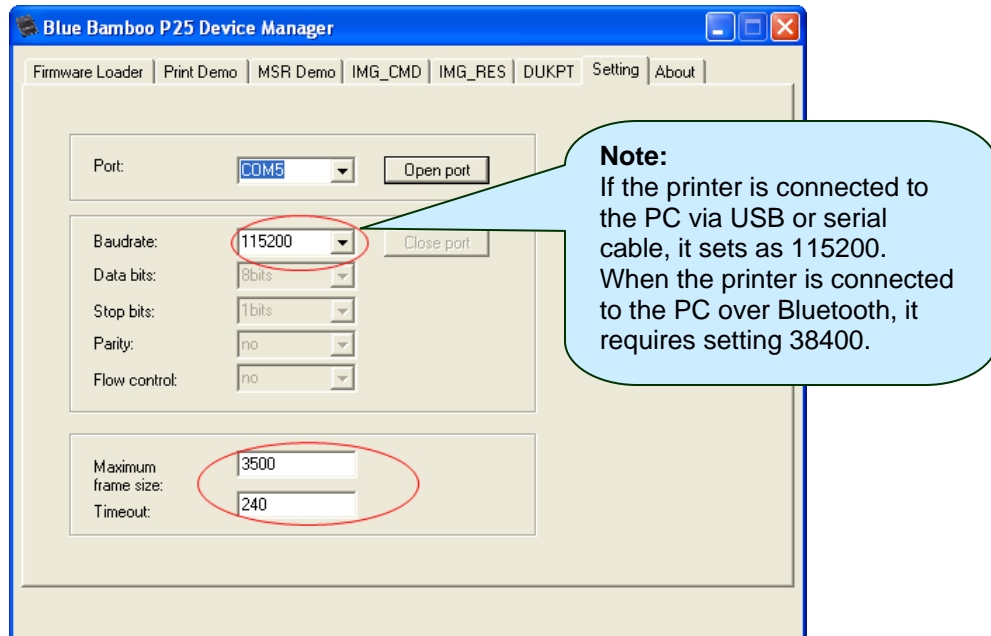


Figure 16

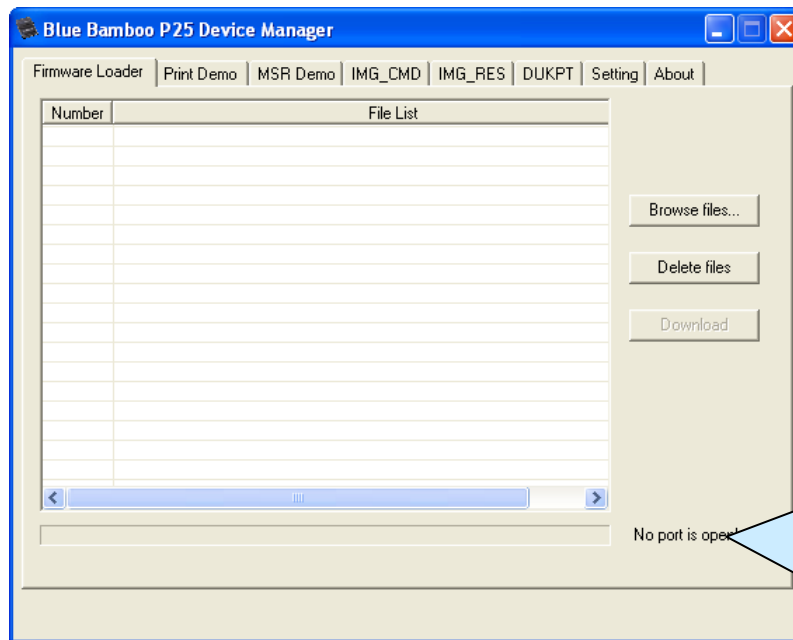
3 Firmware and firmware Loader

From the date 05/08/2010, the P25 which has newer version of bootloader (Version1.0.6) can support firmware loading via both cable and Bluetooth. Before downloading the firmware to P25, you need to get the printer ready for downloading.

Make sure that the P25 enters the downloading mode, the green LED starts to flash slowly (When the P25 is off, press and hold the **Feed** button, then press **Power** button once and release it, and release the **Feed** button). Then connect the printer with PC via USB or serial cable, the P25 is ready to begin. Or you can connect the printer with the PC via Bluetooth, when the blue LED starts to flash slowly, the P25 is ready to begin.

Note: Refer to Appendix B for establishing the Bluetooth connection between P25 and your PC.

Click **Firmware Loader** as shown in Figure 17 to update P25 Firmware.
Before updating P25 firmware, make sure that the correct Port is open.




 **This message shows that the communication port is already open. If there is message “No port is open!” please refer section 2 and click Setting page to open the correct port.**

Figure 17

a. Click **Browse files** to select the file you want to load.

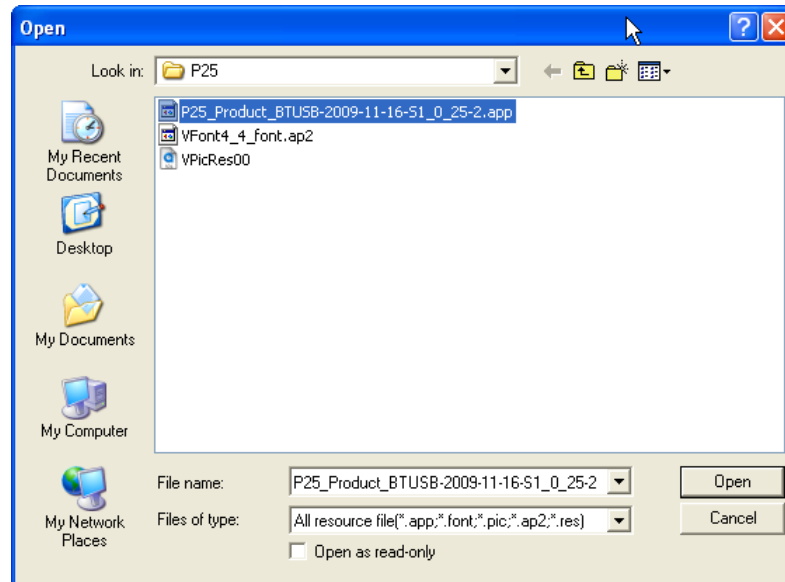


Figure 18

Note:

There are 4 types of supported file as shown below:

.app is for firmware.

.font is for font file.

.pic is for picture file.

.ap2 is a general type for supported files (bootloader, font or pic file)

b. Click **Open** as shown in Figure 18, the file will be added to the **File List**.

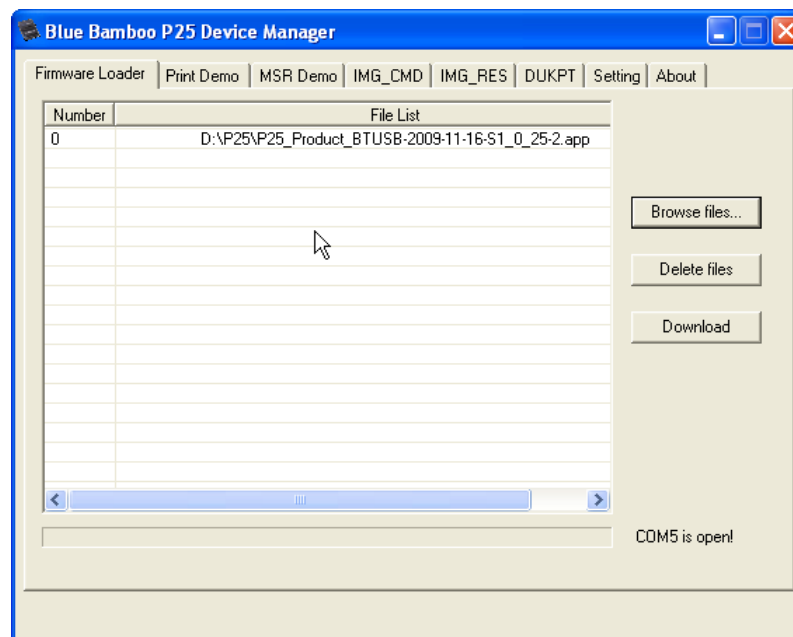


Figure 19

- c. Click **Download** to start downloading.

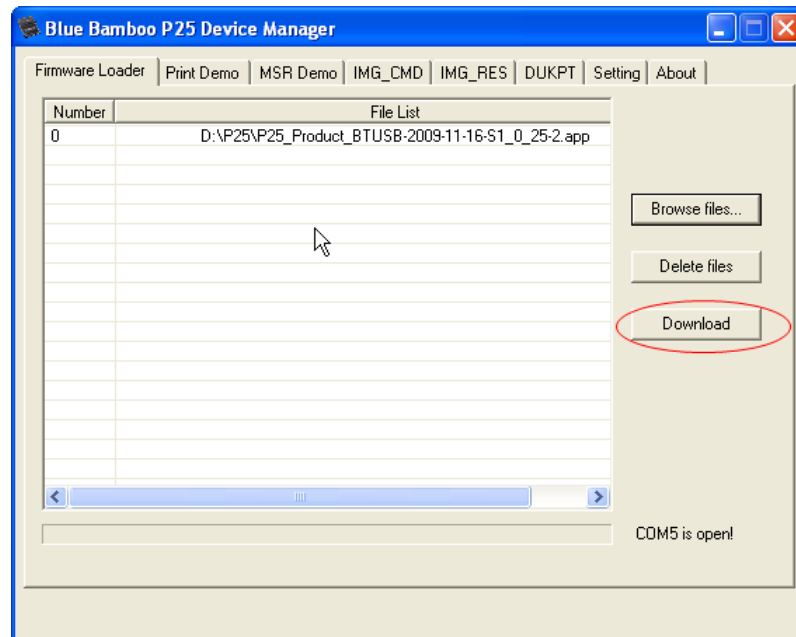


Figure 20

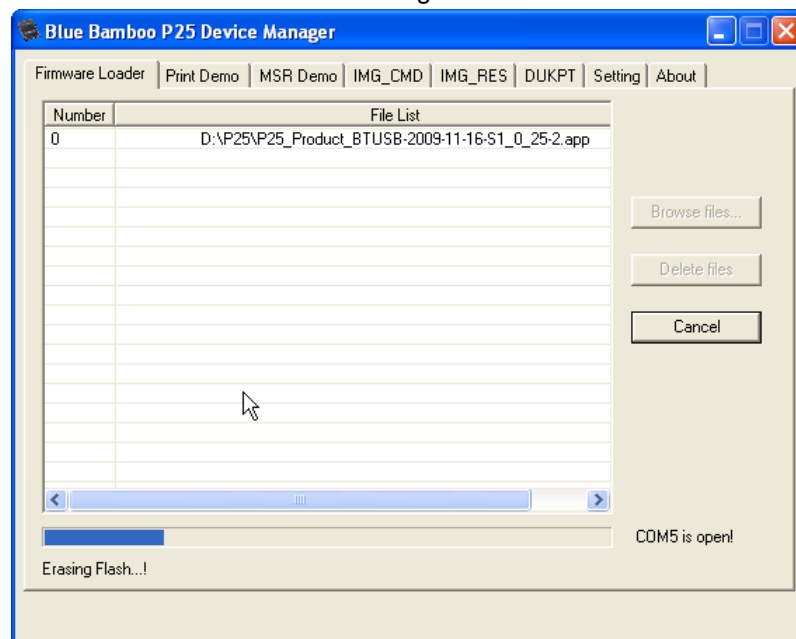


Figure 21

- d. When transfer is finished, the message “Downloading is successful!” displays.

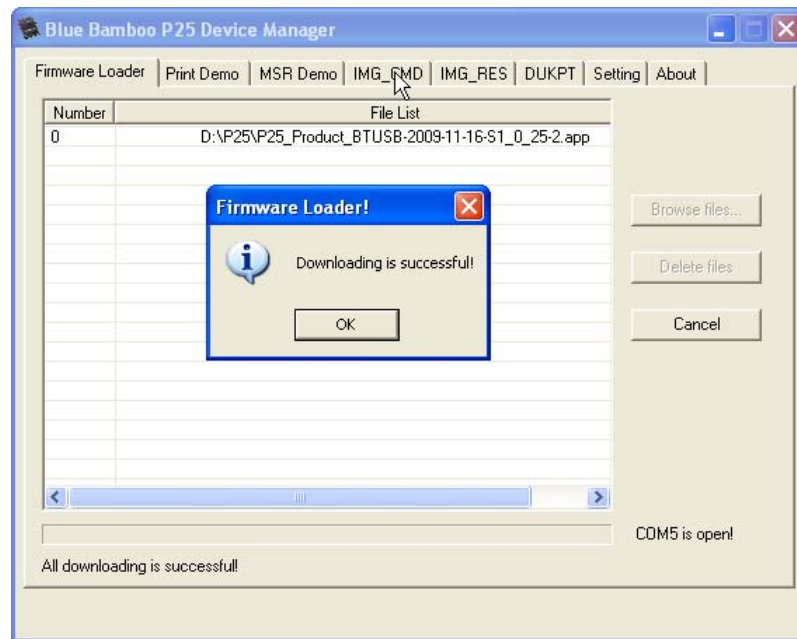


Figure 22

- e. Restart the P25 and the indicator light will turn green; the P25 is now ready for use with the new firmware.
- Note 1: You can click **Delete files** to remove the downloaded file from the list.
Please update the font file together with the firmware.
- Note 2: If you can not download the firmware via Bluetooth successfully, please restart the P25 and reestablish the Bluetooth connection to try again.
- Note 3: When downloading the pic file whose size is more than 128 KB (ap2 picture file whose size is more than 64KB) or some other files which P25 can not support, the blue LED of the printer will light constantly and the P25 Device Manager displays warning message to indicate that the downloading process fails.

4 Print Demo

- Click **Print Demo** to activate the Print Demo page.

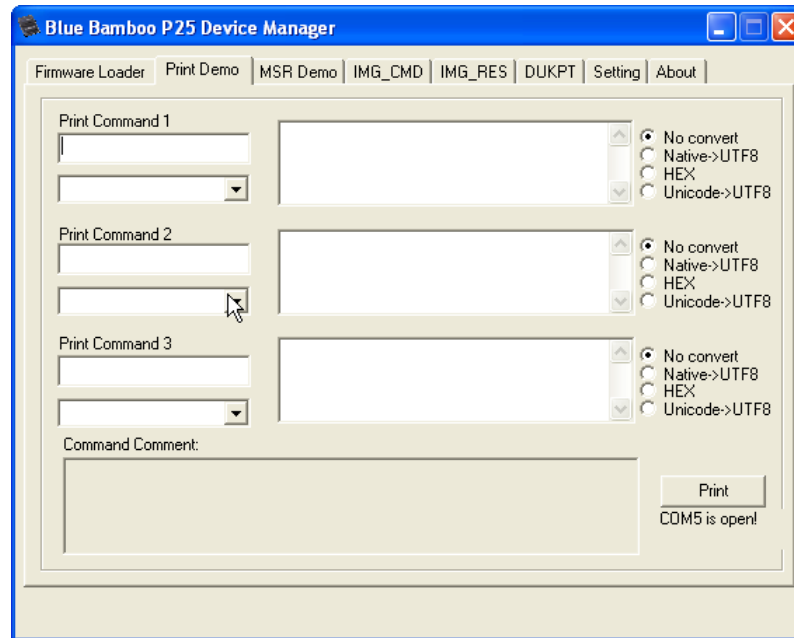


Figure 23

- Input the Print command or choose them from the selection of commands from the drop-down menu, then enter the data into the corresponding data field at the right side of the Print Command and press **Print**. The Print demo will process the Data Field and then the Print command example.

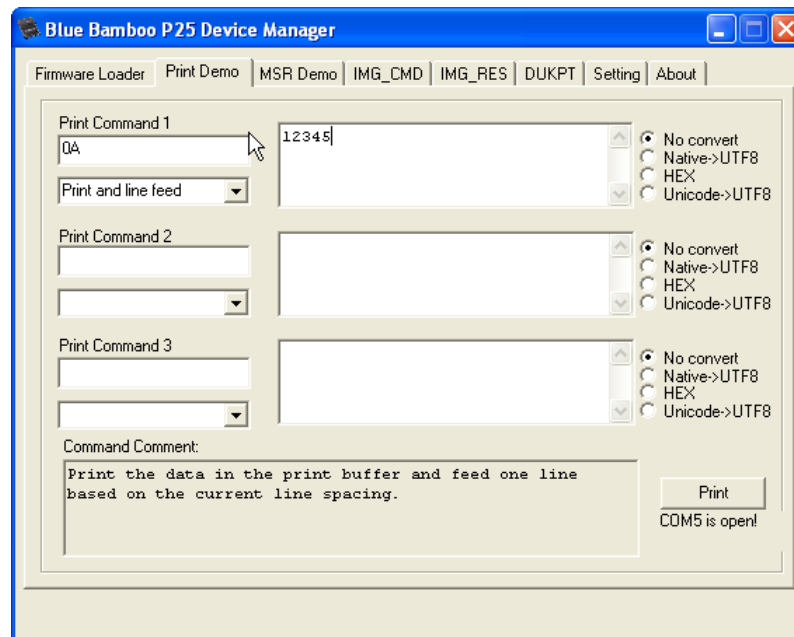


Figure 24

Note: If you select command from the drop down menu, there will be some description in the below Command Comment field to explain the function of this command.

There are four radio buttons for selection:

No convert: The binary data will be send to P25 without any conversions

Native→UTF8: The binary data will be converted into UTF8 sequence and send to the P25

HEX: The binary data will be converted into HEX sequence and send to the P25

Unicode→UTF8: The data will be converted from Unicode standard into UTF8 sequence and send to the P25. The Unicode byte ordering is little-endian, i.e., '0' should be 30 00, not 00 30.

- c. Click **Print** in the bottom right as shown in Figure 25, the Data entered in Data field will be printed out.

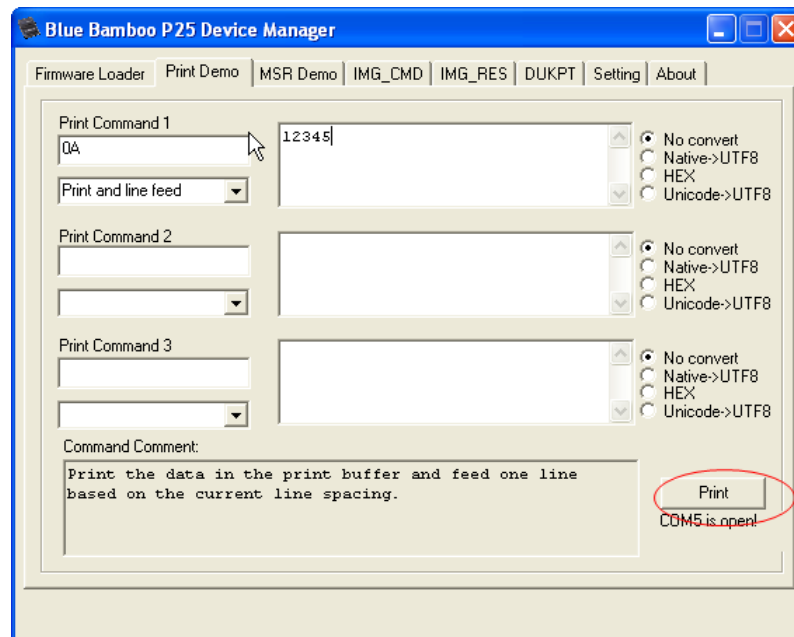


Figure 25

a. Click **MSR Demo** to activate the MSR Demo page.

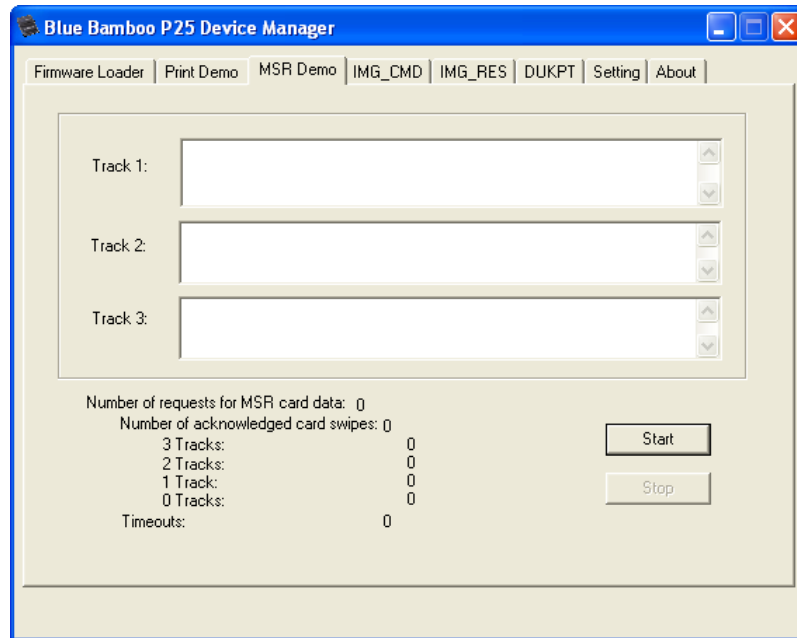


Figure 26

- b. Click **Start** and swipe the card in P25-M MSR reader. The card information will display in the track as shown in Figure 27. The swipes will also be automatically recorded at the bottom of the window. Click **Stop** to exit.

Note: If the P25 printer is DUKPT key injected, please disable the key first and then conduct the MSR demo. (Refer to section 7 DUKPT to disable the key)

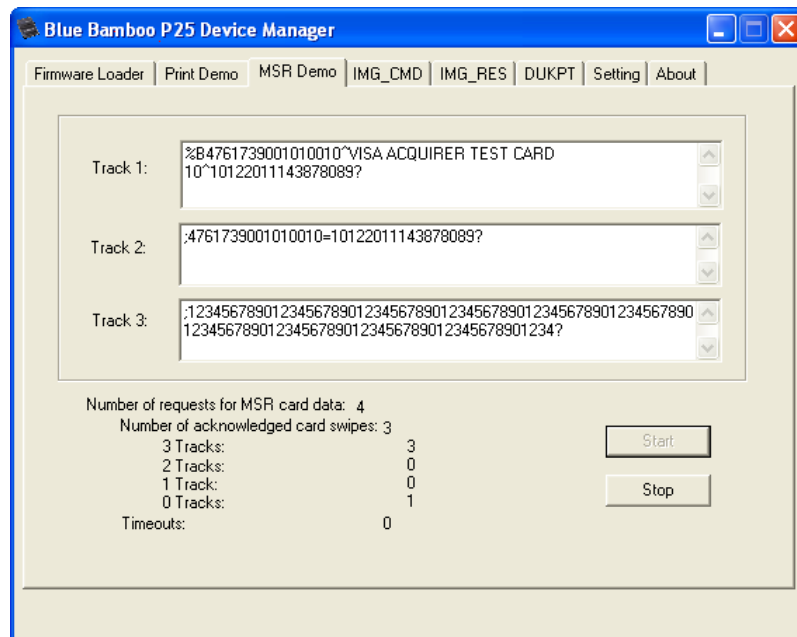


Figure 27

6 IMG_CMD

- a. Click **IMG_CMD** to activate the IMG_CMD page.

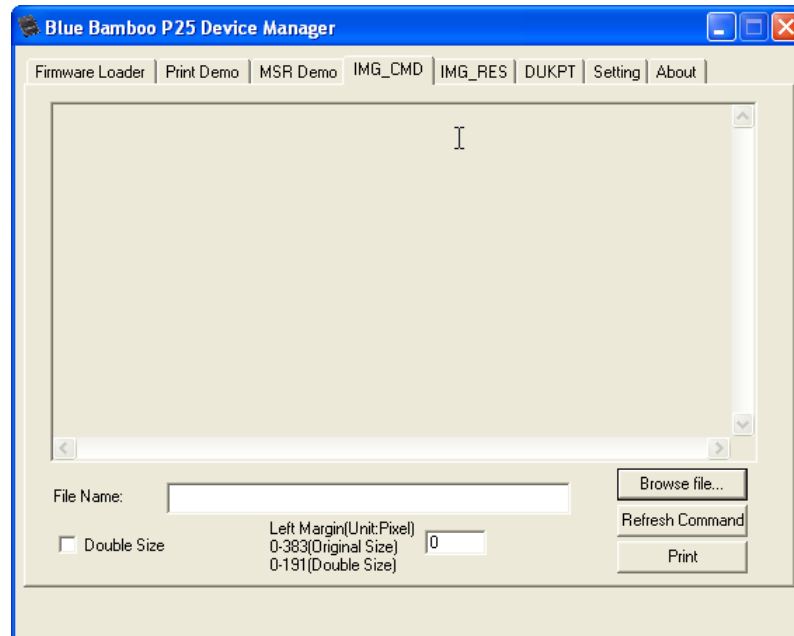


Figure 28

- b. Click **Browse file** to select the bmp file you want to print. The bmp file will be converted to the binary data as shown in the window, which can be programmed to the phone application. Press **Print** to demonstrate the image file

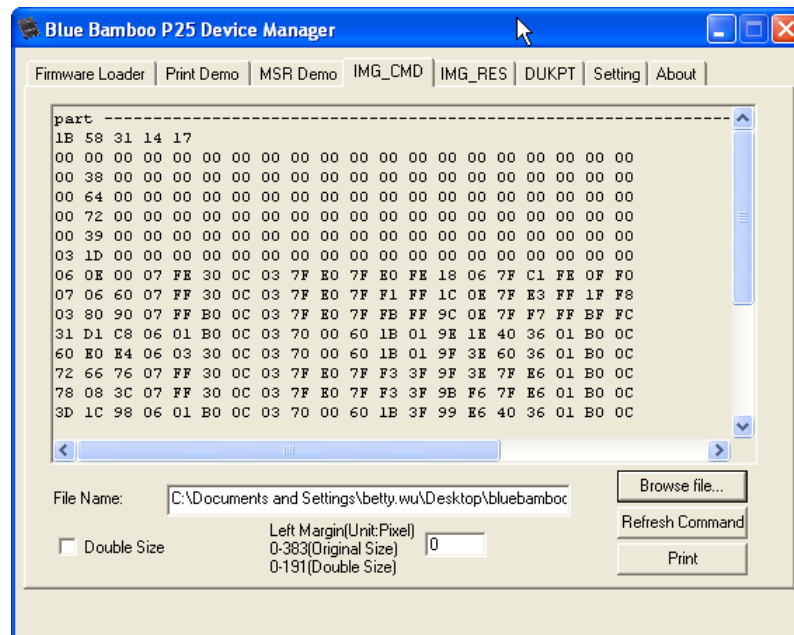


Figure 29

- c. If you want to print the image in the center or right side of the receipt, from version 1.1.26, you can adjust left margin by filling in the desired value in the **Left Margin** field. For example, the width of the receipt is 384 pixels, the width of the image is 28 pixels, you need to input $384-28/2=178$ pixels to relocate the image to the center of the receipt. After inputting the desired left margin, click **Refresh Command** to display the new data, click **Print** to demonstrate the centered image.

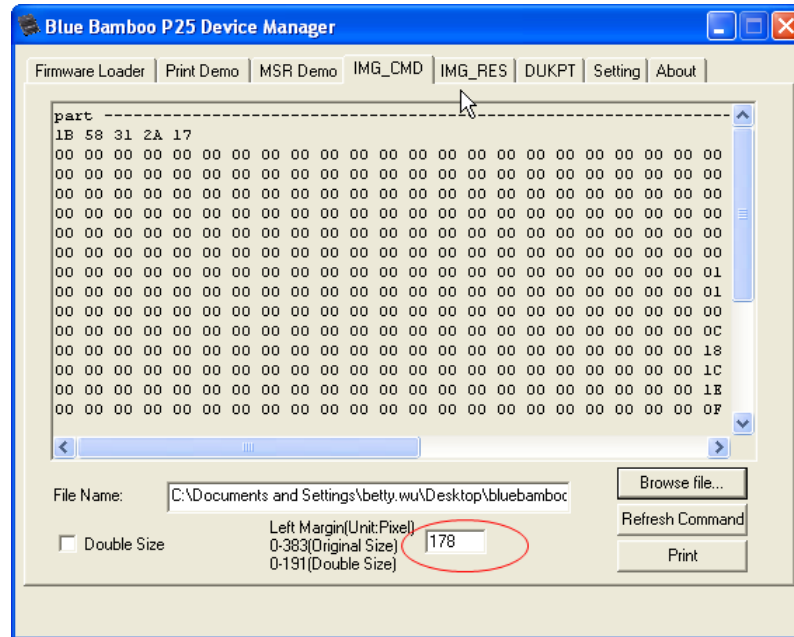


Figure 30



Figure 31 Original Image



Figure 32 Centered Image

- d. You can check the box of **Double Size** to demonstrate the image which is as double size as the original one. If the image is double-sized, you only need to input half value of the original left margin to relocate it to the center of the receipt.

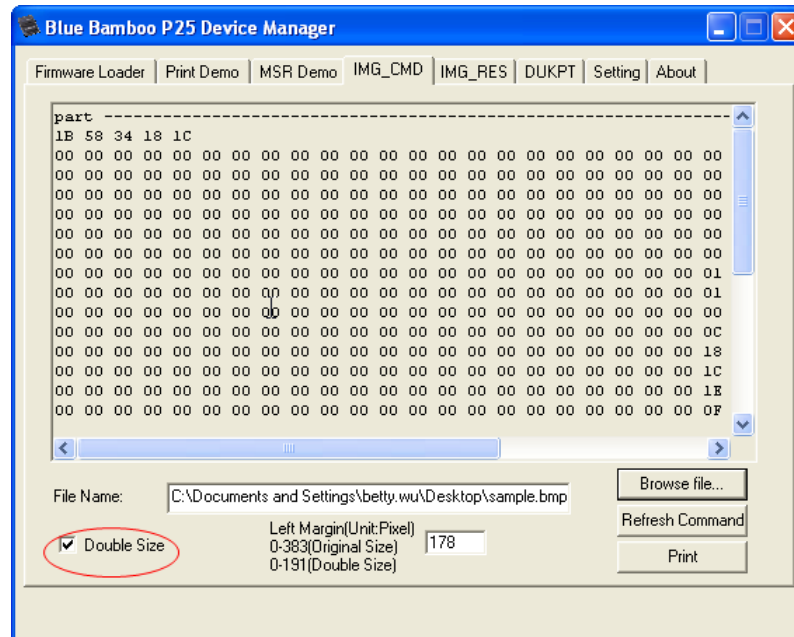


Figure 33



Figure 34 Double-size Image



Figure 35 Double-size Centered Image

- e. The binary data will be separated into several parts if the image file is larger. Each part is an independent printable section. You can select one part and test to print it in **Print Demo** page as shown in Figure 36.

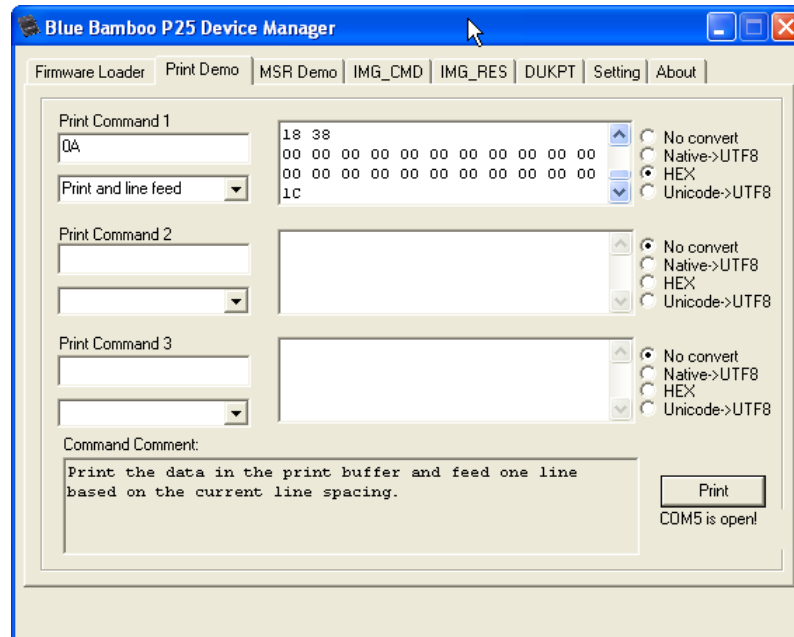


Figure 36

7 IMG_RES

- a. Click **IMG_RES** to activate the IMG_RES page.

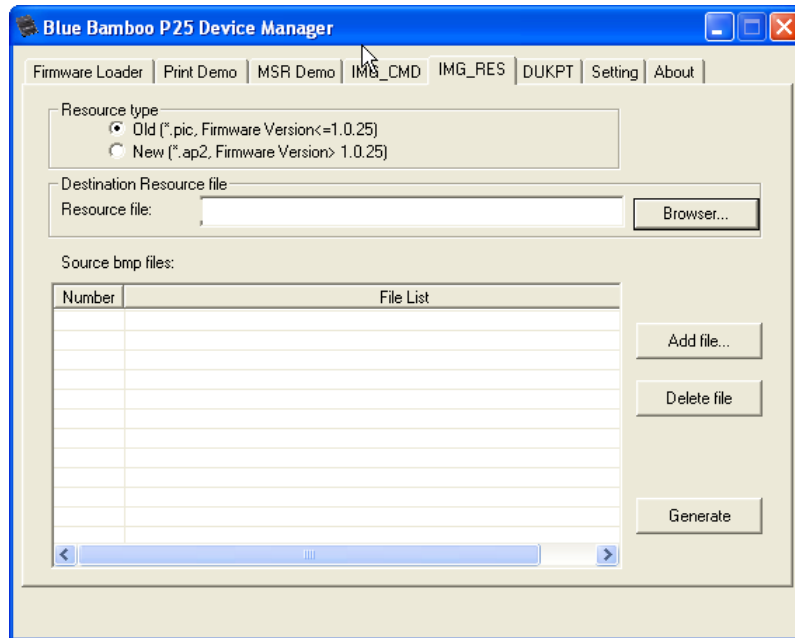


Figure 37

- b. Choose the corresponding **Resource type** according to the firmware version in your P25 printer. If the firmware version is $\leq 1.0.25$, select **Old** and the resource file will be generated as PIC file. If the firmware version is $> 1.0.25$, select **New** and the resource file will be generated as AP2 file. (Figure 38).

Here we choose **Old** as the example.

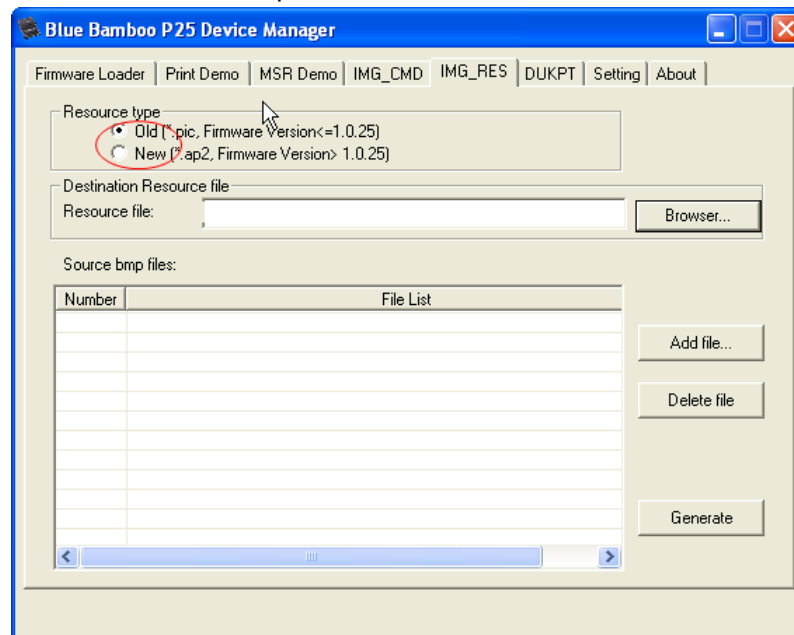


Figure 38


```

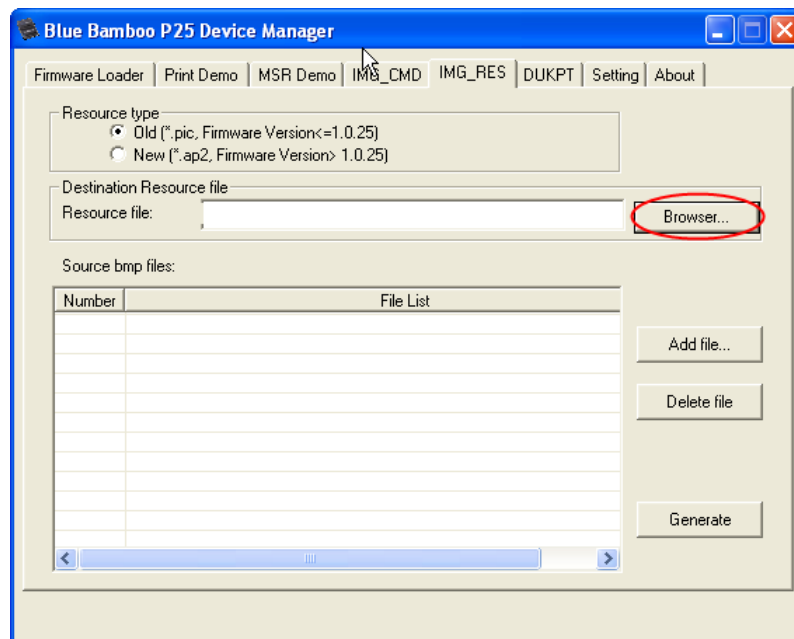
Printer Test Receipt
*****
Compiling date:
Nov 16 2009
Compiling time:
15:54:31
SN: 40006400A083503204
HW ver: H1.0
SW ver: $1.0.25
Battery Voltage: 7.58V
TPH Temperature: 25C
Time to Power off: 15M
BT Discovery: always
Current Speed: 1388pps
Heating Time: 700us
KEY TYPE      LOADED  ACTIVE
MK/SK MAX16   0        0
DUKPT MAX 1    0        0

!'#$%&'()*+,-./012345678
9:;<=?@ABCDEFGHIJKLMNPQ
RSTUVWXYZ[\]^_`abcdefg
hijklmnopqrstuvwxyz{|}~

6 901234 567892

```

c. Click **Browser** to select a folder to save the resource file or input the path of the resource file in the field directly. (Figure 40)



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-

- e. Click **Open** and the full path of the resource file will be displayed.

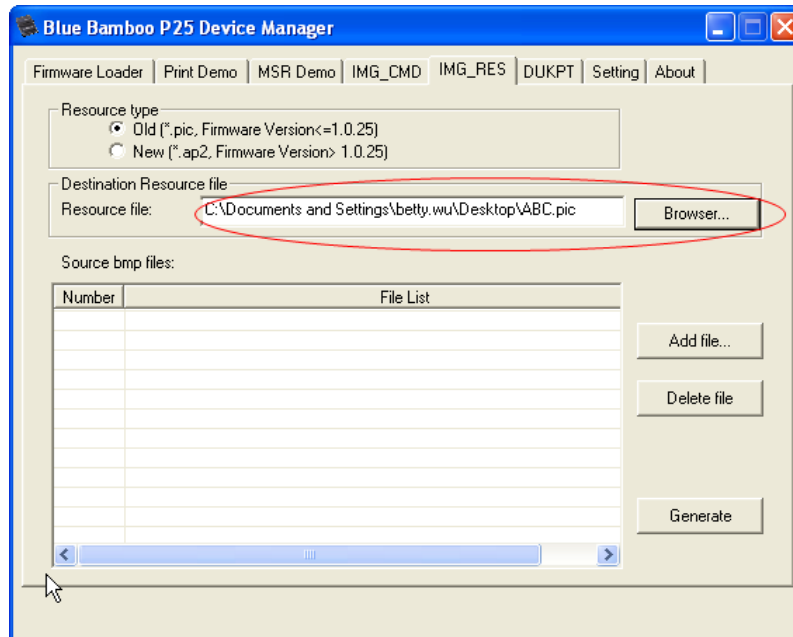


Figure 42

- f. Click **Add file** to select the bmp file you want to upload in the resource file. The number of the file starts from 0 and increments by one every time that one file is added.

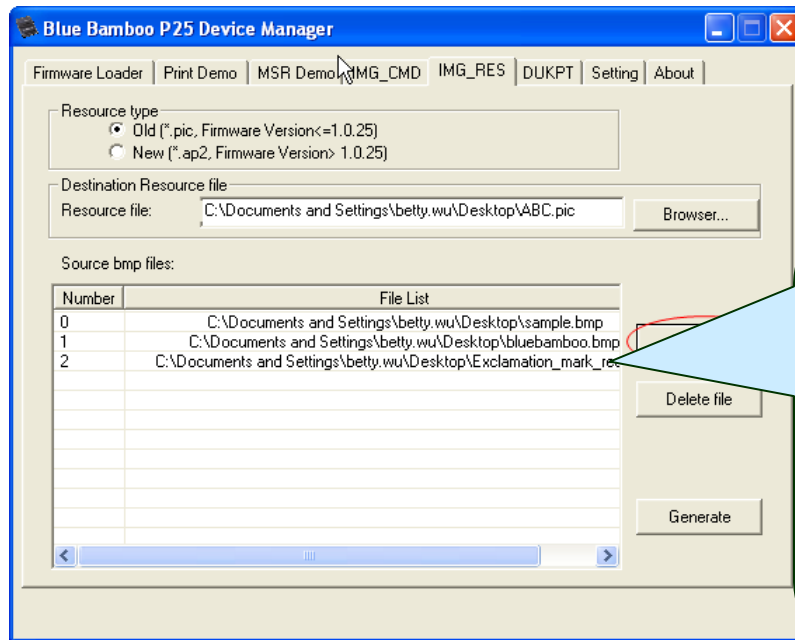


Figure 43

- g. Click **Generate** to generate the resource file. All the bmp files in the file list will be uploaded to the resource file. (Figure 44)

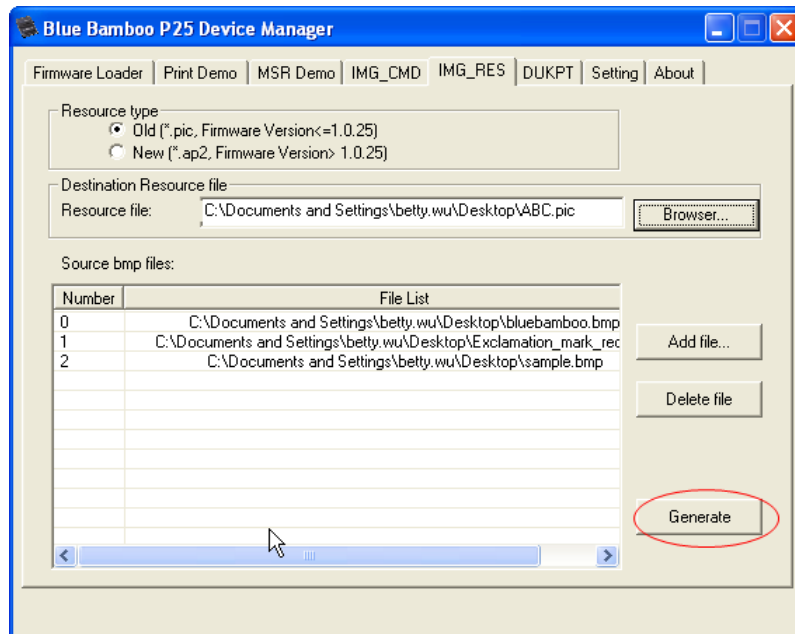


Figure 44

- h. When the generation is finished, success message will display. Now the resource file has been generated successfully. (Figure 45 & 46)

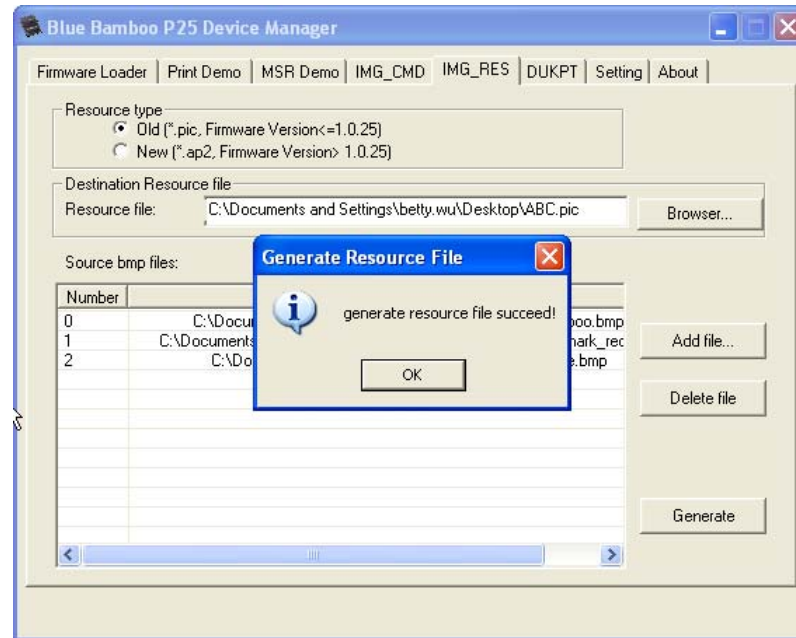


Figure 45

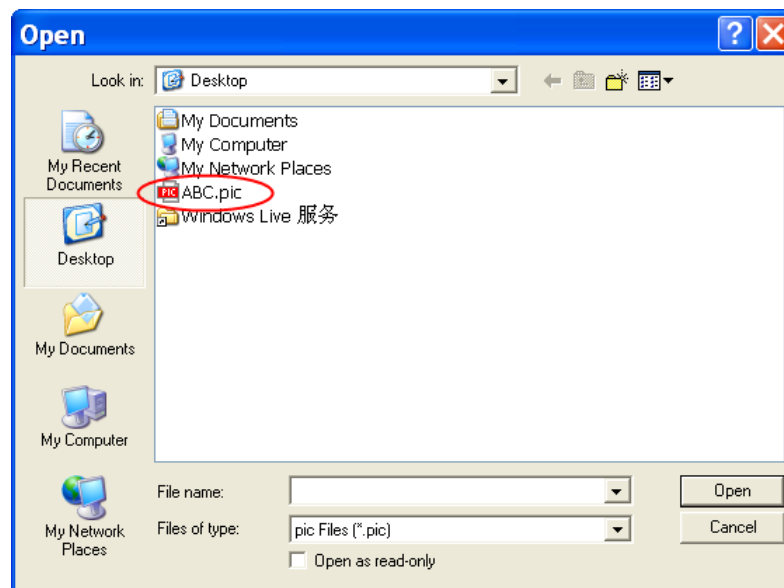


Figure 46

Note: If there are more than 10 bmp files in the file list or the total size is more than 128KB, after you click the **Generate** button, the Device Manager will display the warning message as shown as Figure 47. Please delete some files and try again.

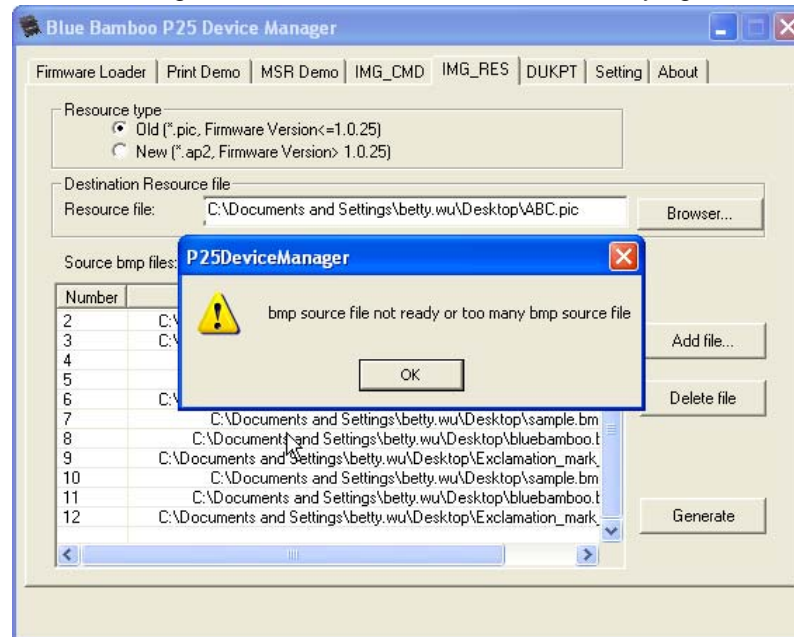


Figure 47

- i. Enter the **Firmware Loader** to download the generated resource file to your P25 printer. (Refer to section 3 **Firmware Loader**)
- j. After downloading the resource file to the printer, click **Print Demo** to active the Print Demo page then choose the corresponding command from the drop down menu as Figure 48

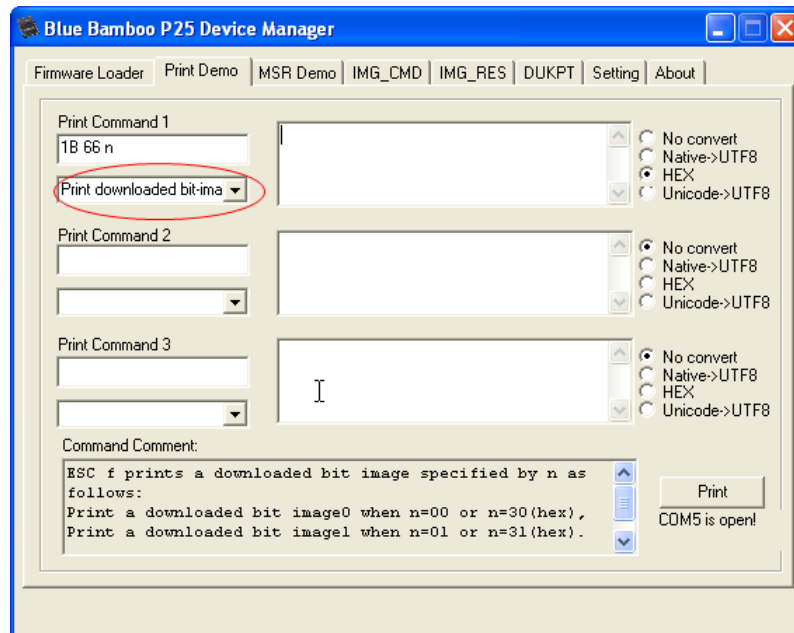


Figure 48

- k. The function of the command will be explained in the **Command Comment**. Input corresponding value in the **Print Command 1** field according to the number of the bmp file in the file list and click **Print** to demonstrate the image file.

Note: The image which is demonstrated here is double sized than its original one.

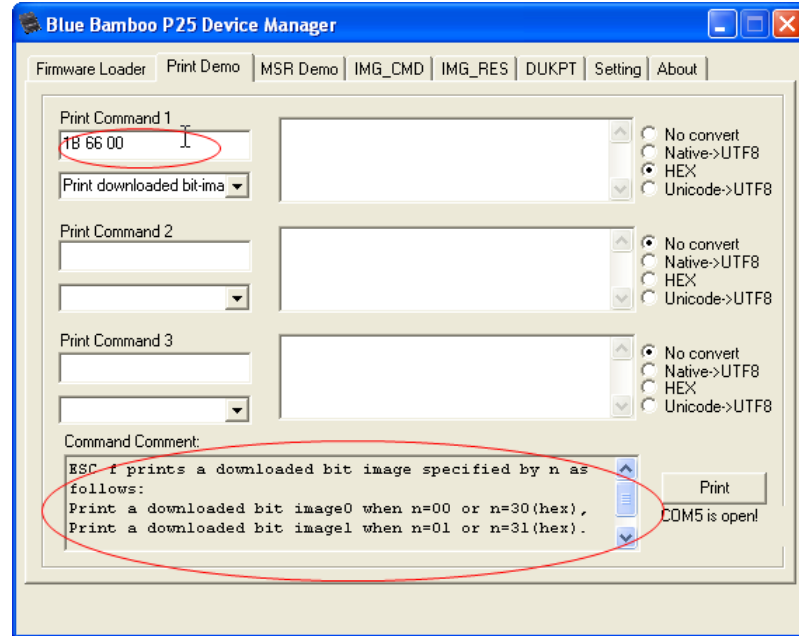
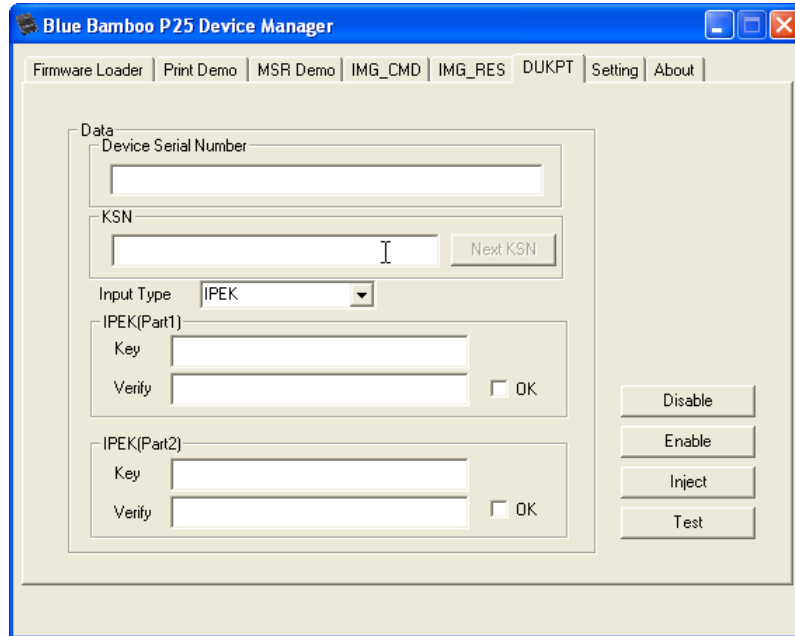


Figure 49

8 DUKPT

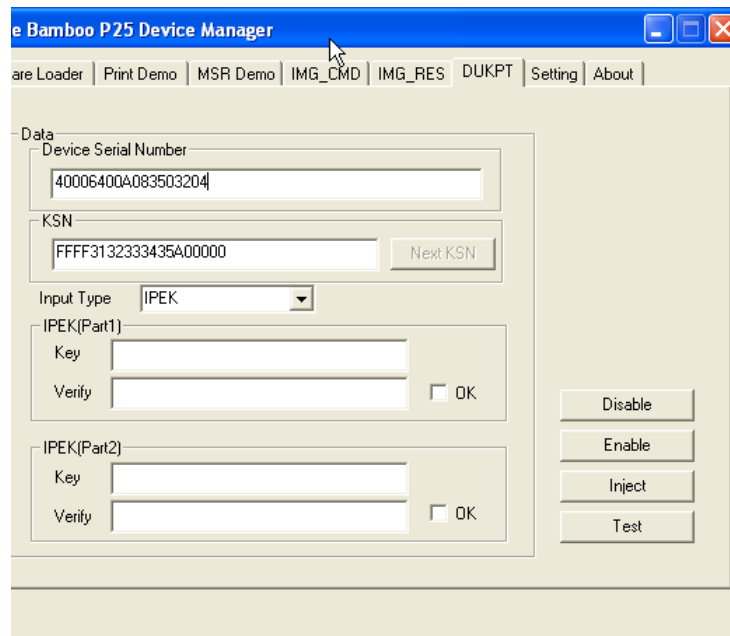
- a. Click **DUKPT** to activate the DUKPT page.



The screenshot shows the 'Blue Bamboo P25 Device Manager' window with the 'DUKPT' tab selected. The window has a menu bar with 'Firmware Loader', 'Print Demo', 'MSR Demo', 'IMG_CMD', 'IMG_RES', 'DUKPT', 'Setting', and 'About'. The main area is titled 'Data' and contains several input fields: 'Device Serial Number' (empty), 'KSN' (empty) with a 'Next KSN' button, 'Input Type' (set to 'IPEK'), 'IPEK(Part1)' with 'Key' and 'Verify' fields and an 'OK' checkbox, and 'IPEK(Part2)' with 'Key' and 'Verify' fields and an 'OK' checkbox. On the right side, there are four buttons: 'Disable', 'Enable', 'Inject', and 'Test'.

Figure 50

- b. Enter the Device Serial Number, KSN (Key Serial Number) in the corresponding text box as shown in Figure 51



The screenshot shows the same 'Blue Bamboo P25 Device Manager' window with the 'DUKPT' tab selected. The 'Device Serial Number' field now contains '40006400A083503204'. The 'KSN' field now contains 'FFFF3132333435A00000'. The 'Next KSN' button is visible. The 'Input Type' is still 'IPEK'. The 'IPEK(Part1)' and 'IPEK(Part2)' sections are still empty. The buttons on the right are 'Disable', 'Enable', 'Inject', and 'Test'.

Figure 51

Note: Please refer the P25 Development Guide to check the format of set KSN.

- c. To ensure the key management safety, the key components are maintained under dual control. Select **Input type** from the drop-down menu, input the value of Part 1 in the Key text box and input again to verify it, click **OK**, the value entered will become “ * “. Then input the value of Part 2, and input again to verify it, click **OK**, the value entered will become “ * “. You can click **Inject** button to inject the key to the P25.

Note:

1. The DUKPT key only supports 3DES algorithm.
2. It requires you input 32 hexadecimal strings in both Part 1 and Part 2. The P25 Device Manager will convert the two parts into binary strings separately, and use XOR (Exclusive OR) operation on the binary strings to generate the value of the key.
For example, if you input 11 11...11 11 (total 32 digits) in the part 1, it will be converted to binary strings as 0001 0001 0001....0001 (total 32 4-bits), input 22 22...22 22 in part 2, it will be converted to 0010 0010 0010...0010. Then the two parts will be XORed to generate the key value 0011 0011 0011 0011...0011 which is in binary format, converting to hexadecimal format is 33 33...33 33.
3. The cryptography algorithms are only available for the printers on which the keys are injected. The new loaded key will replace the existing key in the printer.

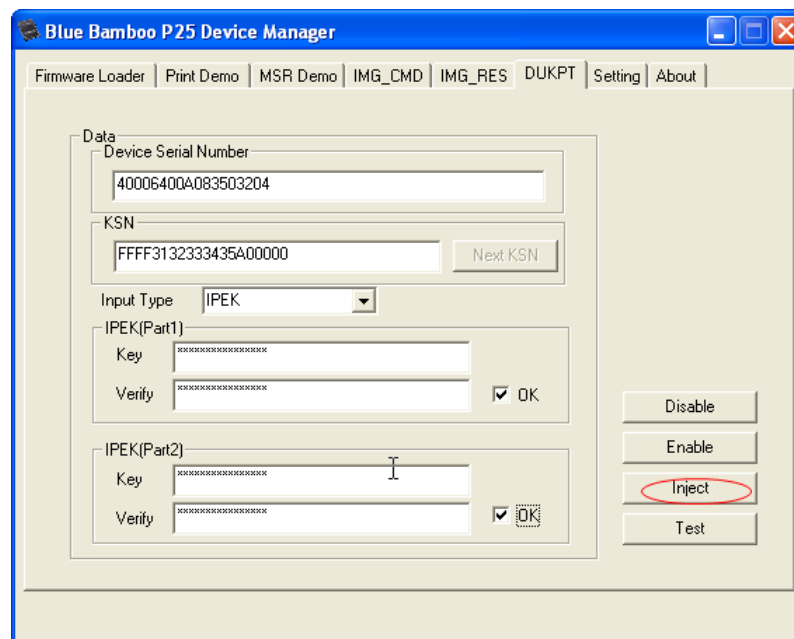


Figure 52

- d. Success message will be displayed as shown in Figure 53

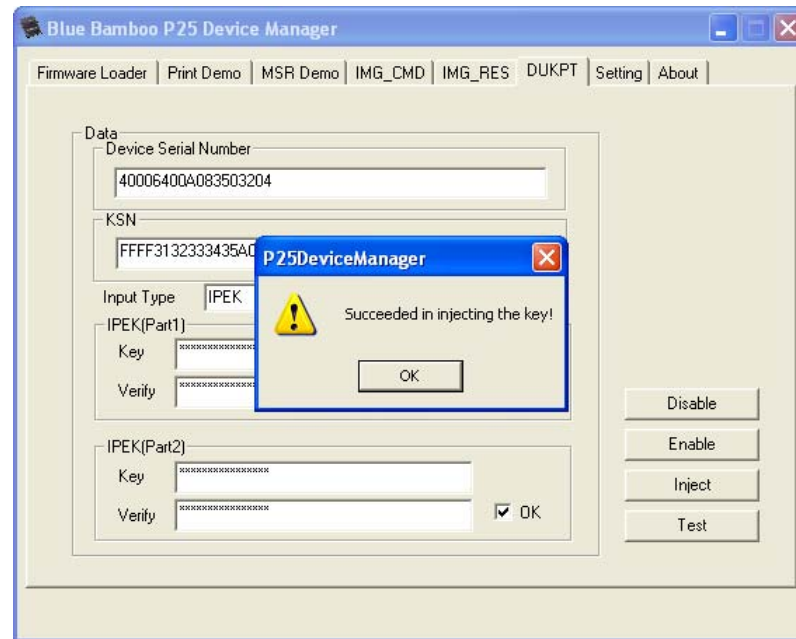


Figure 53

Note: The user can check the status of the key in the printer from the self test receipt. Hold the **Mode** button and press the **Feed** button at the same time to print the self test receipt, as shown as Figure 54

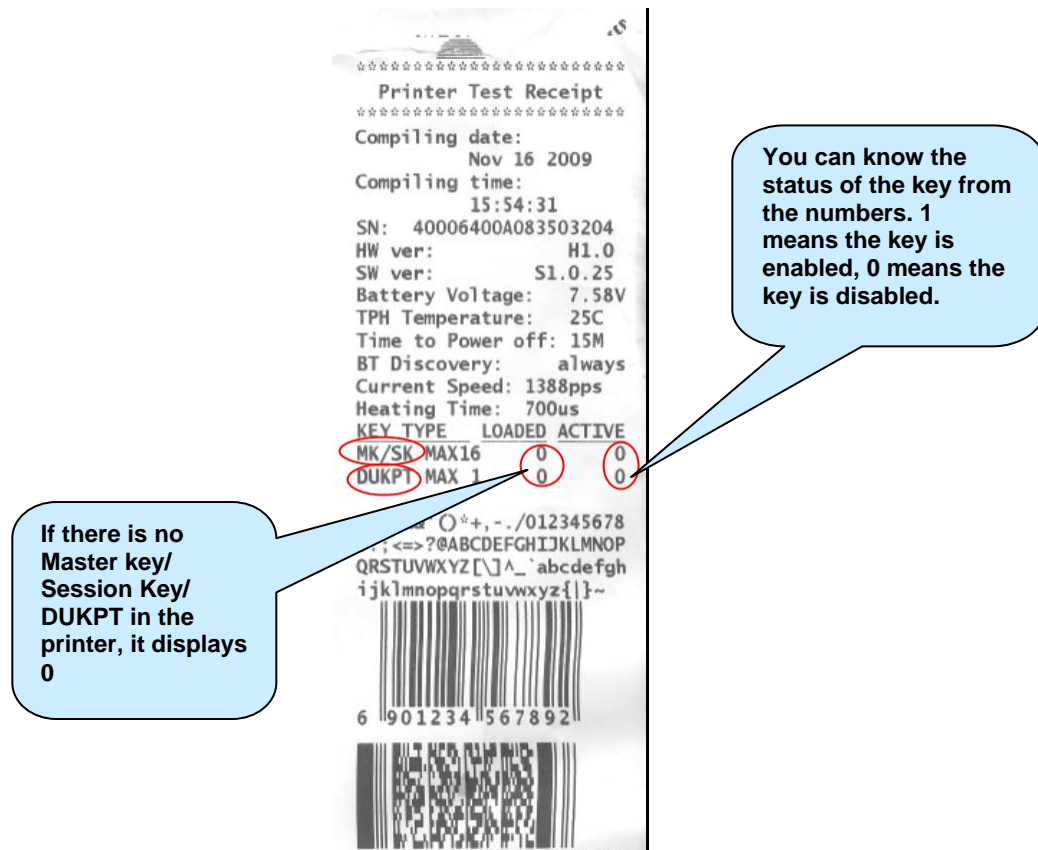


Figure 54

- e. Click **Disable** button to disable the key, click **Enable** button to enable the key. Success message will be displayed as shown in Figure 55

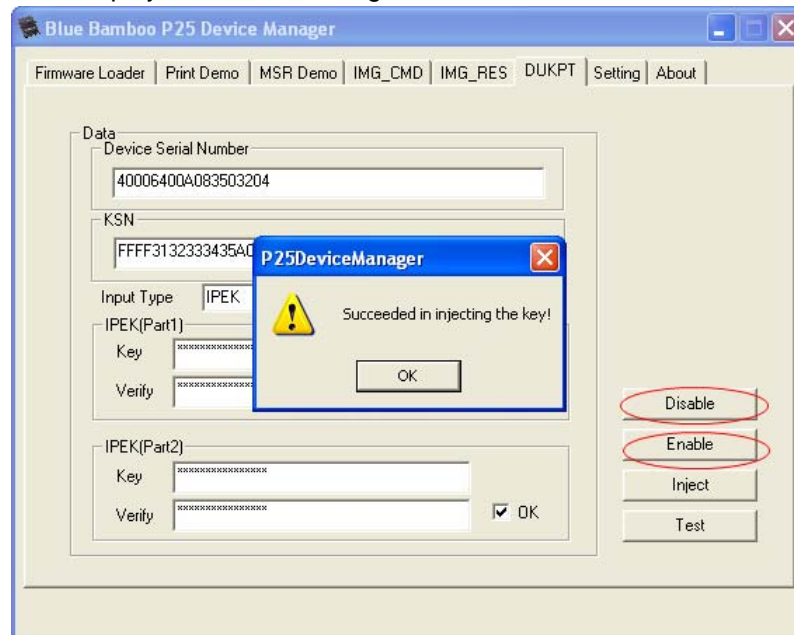


Figure 55

- f. You can click **Test** button to check if the key can decrypt the encrypted card information.

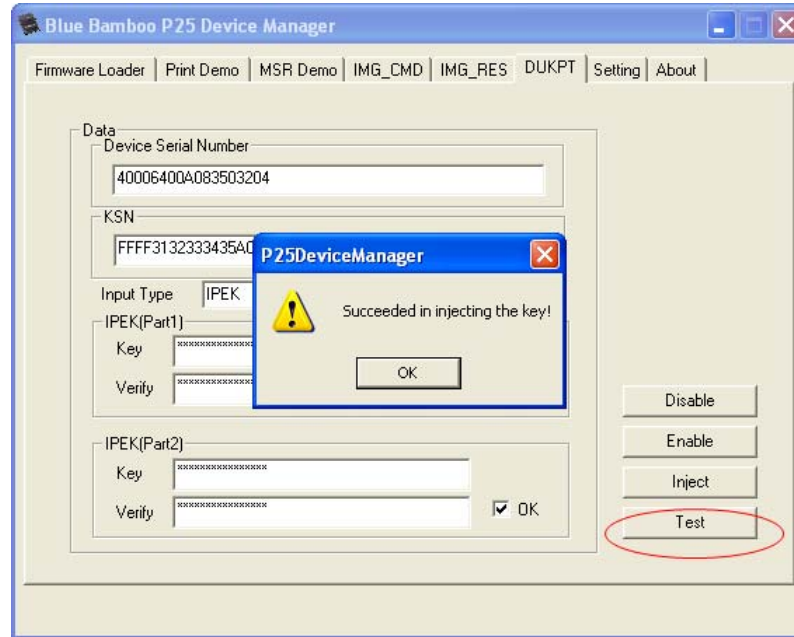


Figure 56

Note: Please swipe the card in 20 seconds after you click **Test** button. MSR message will be displayed as Figure 57

If the DUKPT key is disabled, the MSR data will be displayed in the text format, if the key is enabled, the MSR data will be encrypted.

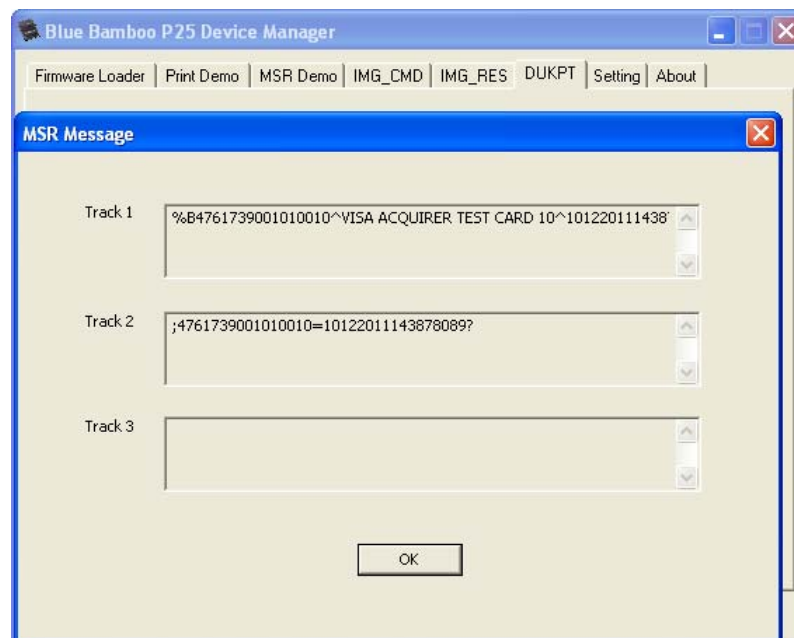


Figure 57

9 About

Click **About** to activate the About page as shown in Figure 58. You can view the Version of P25 Device Manager. Updates to the P25 Device Manager can be found at www.bluebamboo.com/support.

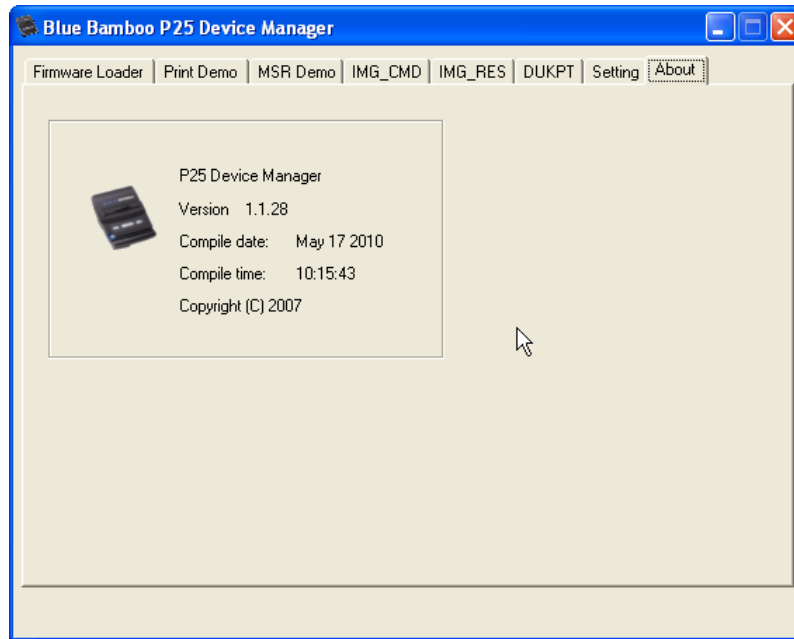


Figure 58

10 Revision History

Revision 1.0 (June 01, 2007)	Initial Release.
Revision 1.1 (October 01, 2007)	Change the software name to P25 Device Manager. In the Windows XP operation system, add the Found New Hardware Wizard section as a guide for the first time when you connect the P25 USB Device Manager to PC.
Revision 1.2 (Feb 18, 2008)	Update some information about the font file update.
Revision 1.3 (Feb 19, 2009)	Add Image and DUKPT feature.
Revision 1.4 (Sep 08, 2009)	Add LED flashing sequence description in section 3
Revision 1.5 (Nov 30, 2009)	Update the process of installation. Rearrange the Print Demo page, add the Unicode→UTF8 option.
Revision 1.6 (Dec 04, 2009)	Delete the Print Cycle button on the Print Demo Page
Revision 1.7 (Dec 15, 2009)	Update the section 2 and 3, add the appendix A.
Revision 1.7.1 (Mar 16, 2010)	Add description on the Left Margin feature. Add description on Windows 7 edition.
Revision 1.7.2 (Mar 24, 2010)	Add self test receipt for check DUKPT key.
Revision 1.8 (May 27, 2010)	Add the new feature of supporting firmware downloading via Bluetooth. Add the new function of IMG_RES page.

Appendix A

Where to find your Windows Device Manager?

A. Windows XP edition

- a. Select **My Computer** icon on your desktop, right click as Figure 59

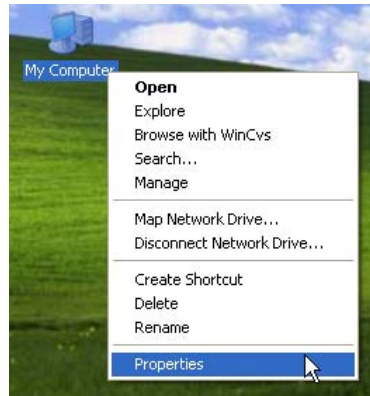


Figure 59

- b. Open **Properties** page and click **Hardware** tab, the hardware information of your computer will be showed as Figure 60

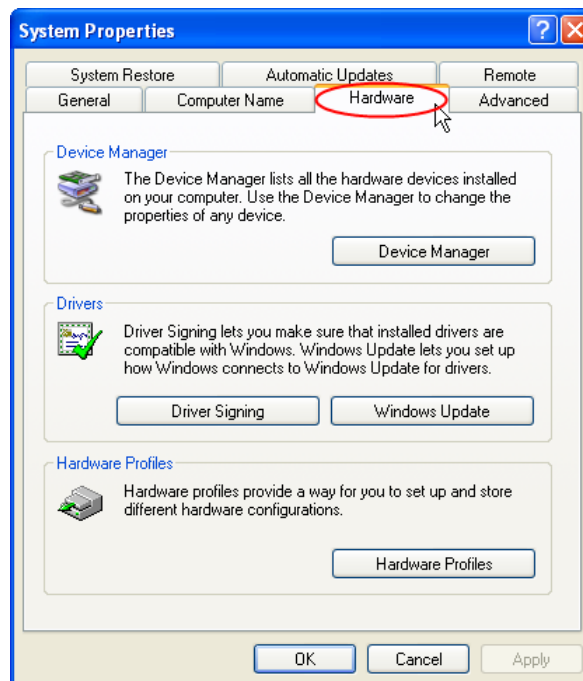


Figure 60

- c. Now you can click **Device Manager** tab to see the device lists of your computer.

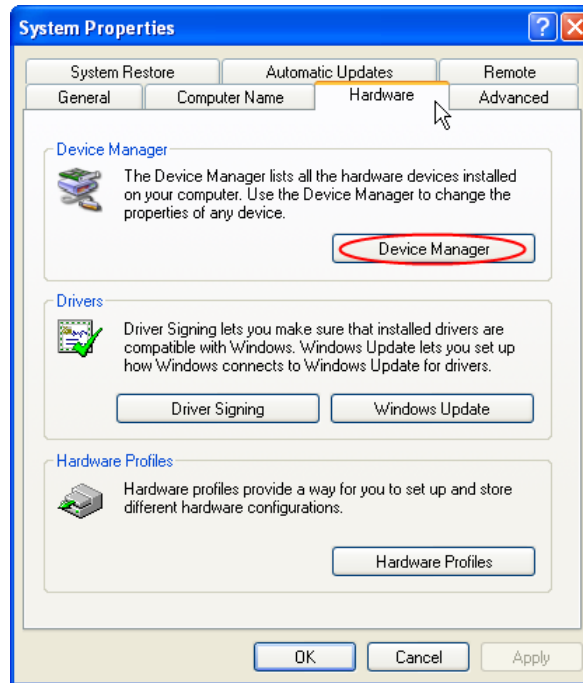


Figure 61

B. Windows 7 edition

- a. Select **Computer** from the start menu, right click as Figure 62.

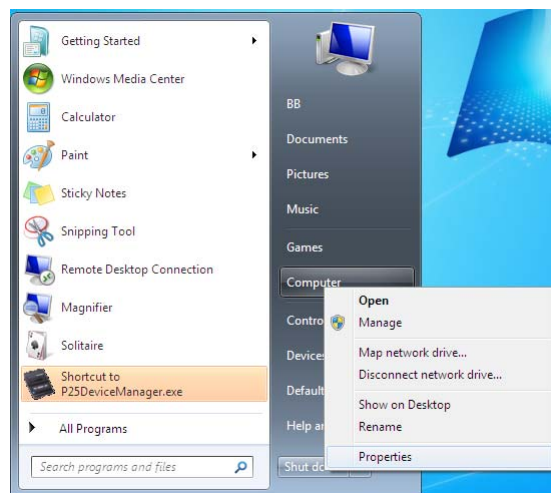


Figure 62

- b. Open **Properties** page and click **Device Manager** tab as Figure 63.

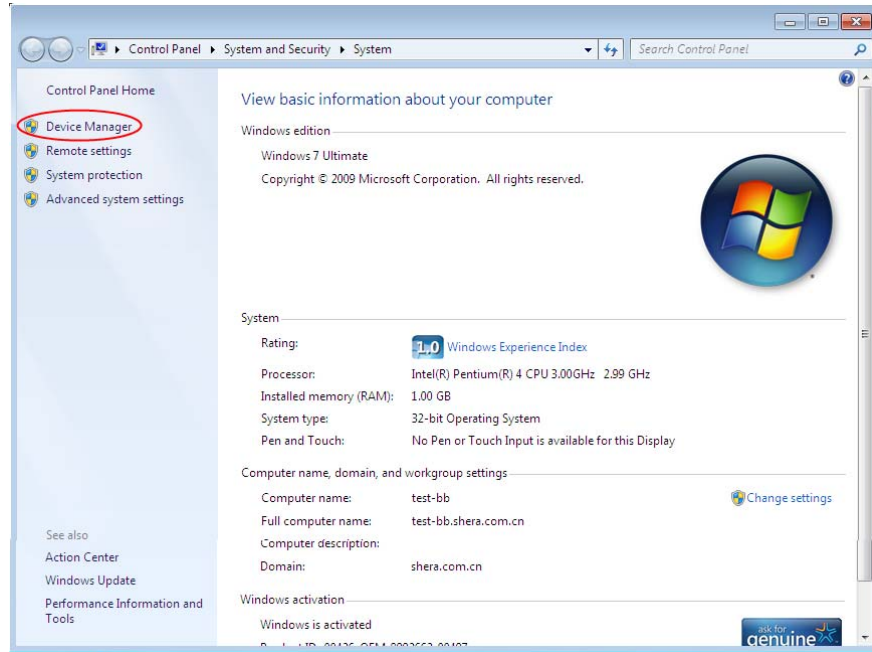


Figure 63

Appendix B

How to establish the Bluetooth connection between P25 and your PC before downloading firmware to the printer over Bluetooth?

This requires you run the Bluetooth application on your PC with Bluetooth enabled. i.e. BlueSoleil™

- a. Making sure the printer is in the DOWNLOADING MODE (green LED flashing), launch the BlueSoleil™ application and double click the large orange ball in the middle of the main window to search for the Bluetooth printer.

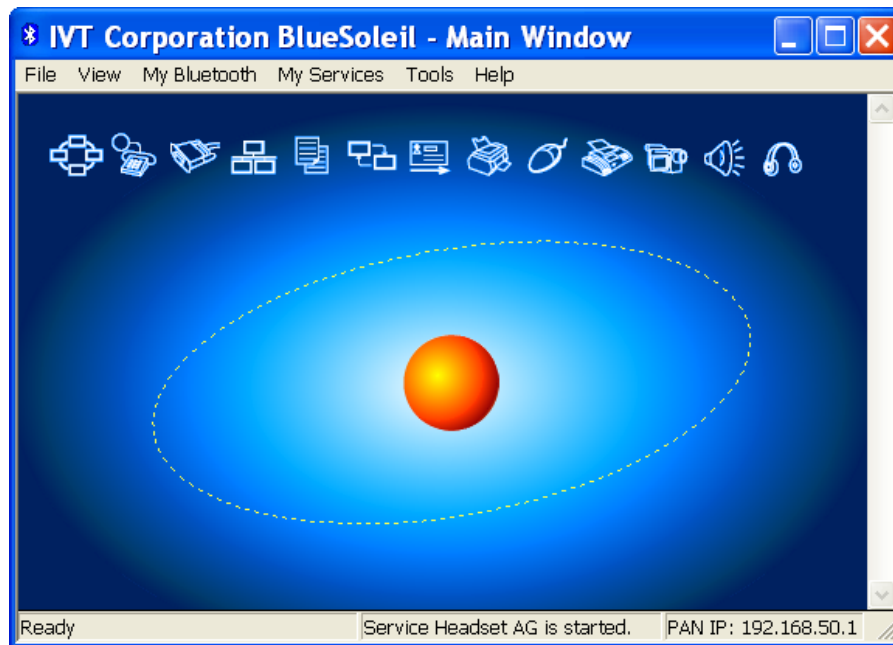


Figure 64

- b. After a few seconds, the application will find all available Bluetooth Devices in range and then a minute later will refresh the devices names as shown in Figure 65.
(Note: You can find the Device Name of your Bluetooth printer under the paper roll of the printer).

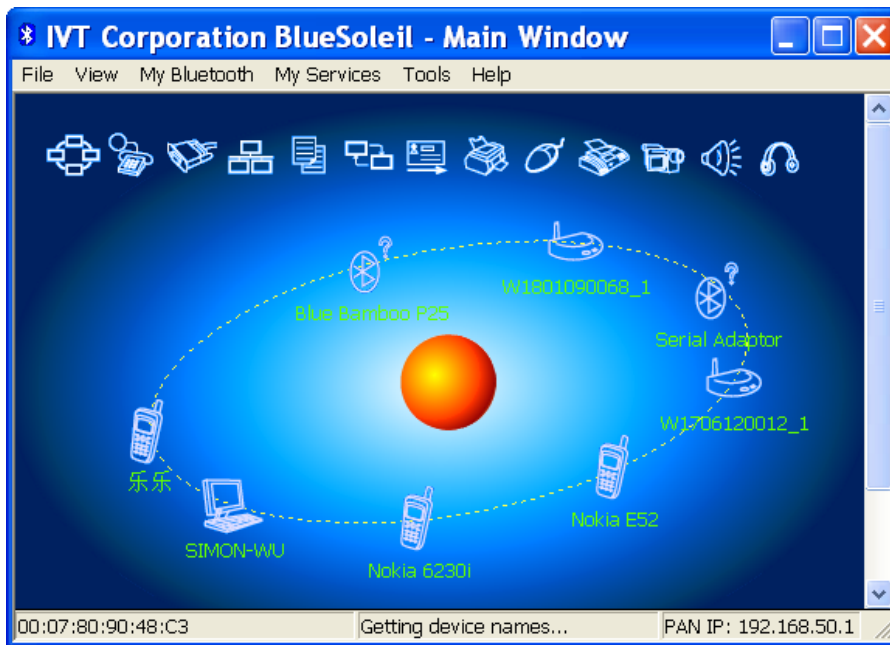


Figure 65

- c. Double click the Device Name of the printer (i.e. Blue Bamboo P25) to enable the **Bluetooth Serial Port Service** as shown in Figure 66.

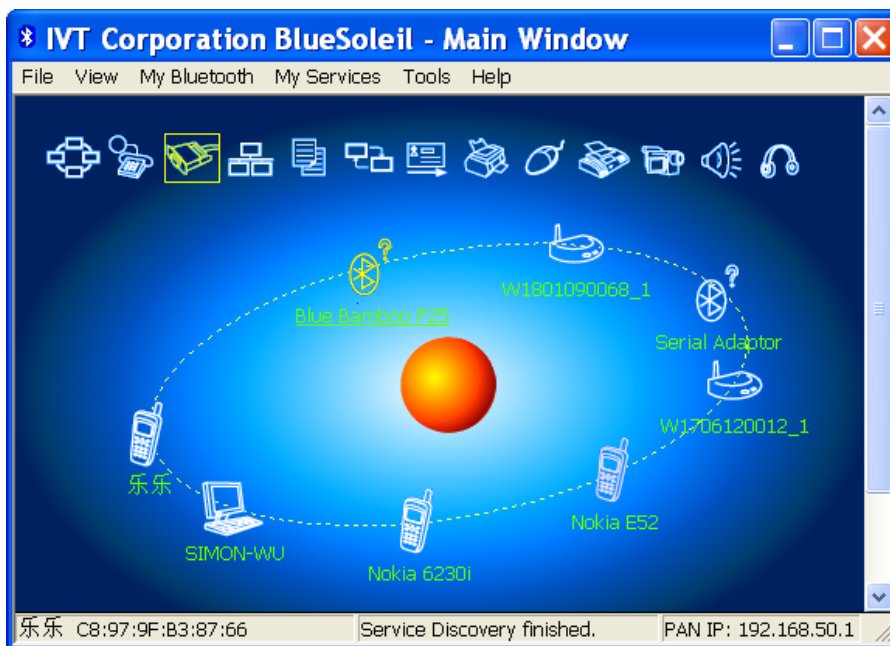



Figure 66

d.

Double click the **Bluetooth Serial Port Service** icon  to bring up the **Paskey** dialog box as shown in Figure 54. Then enter the printer Pin Code which can be found under the print roll of the printer and click **Ok** to connect the printer.

(Note: No Pin Code entry will be required if you have previously paired the printer with BlueSoleil™).

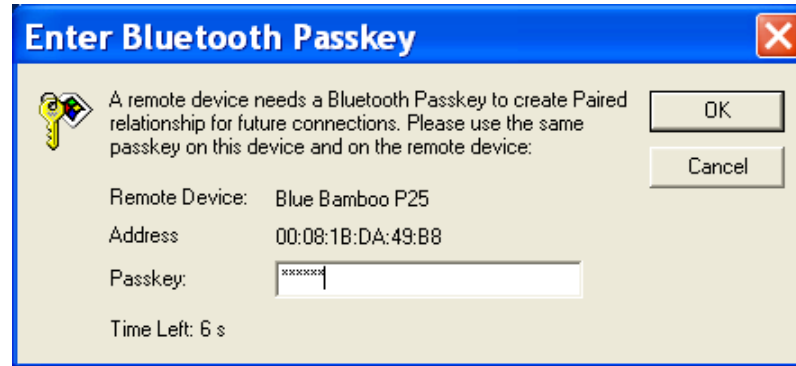


Figure 67

e.

After a few seconds the printer will be connected and display a dotted line with a moving red dot as shown in Figure 68 to indicate a working connection and the BLUE LED will flash on the printer.

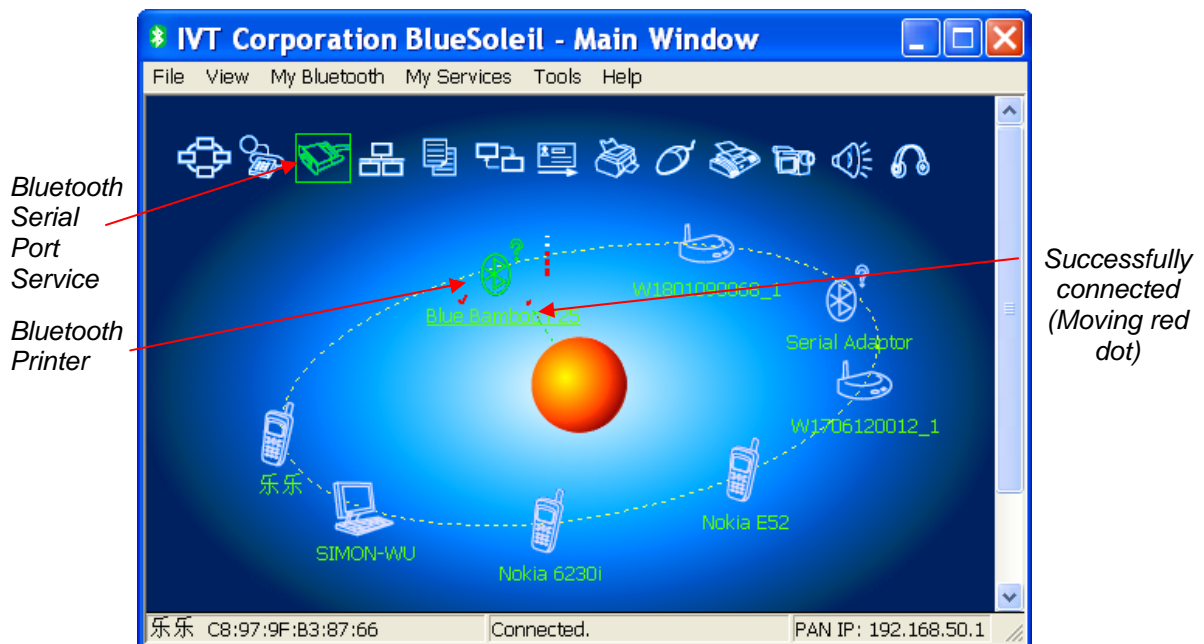


Figure 68

f.

As soon as the bluetooth connection established, the Notification Message will pop up at the bottom right corner of your PC desktop to indicate associated com port has been connected to the printer, (Figure 69). Please select this com port number on the Setting page of the P25 Device Manger before loading the firmware to the printer over Bluetooth. (Refer to section 2.1)

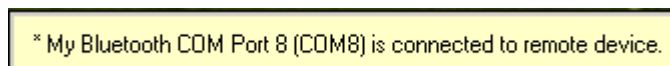


Figure 69

Note: You can also right click the Device Name on the Main Window, and choose **Status** as Figure 70. The Bluetooth com port can be viewed at the **Remote Device Status** window as Figure 71.

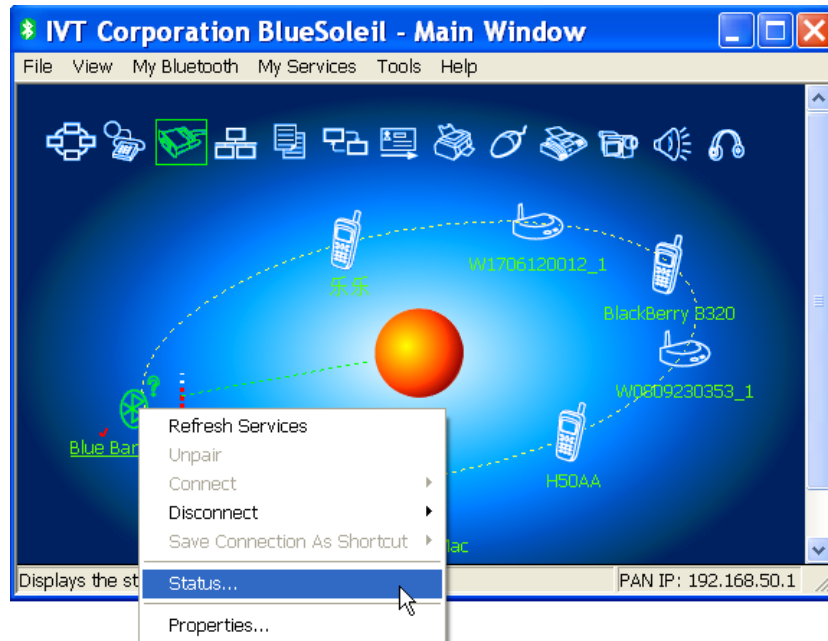


Figure 70

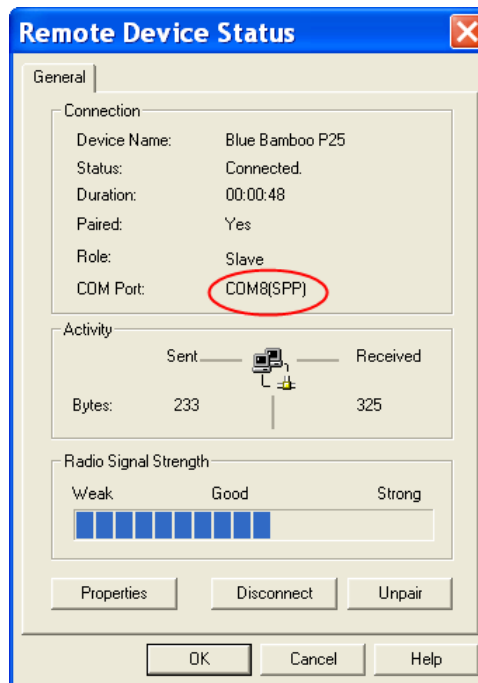


Figure 71

9. To disconnect the printer, right click the Device Name on the Main Window, and choose **Disconnect→Bluetooth Serial Port..**

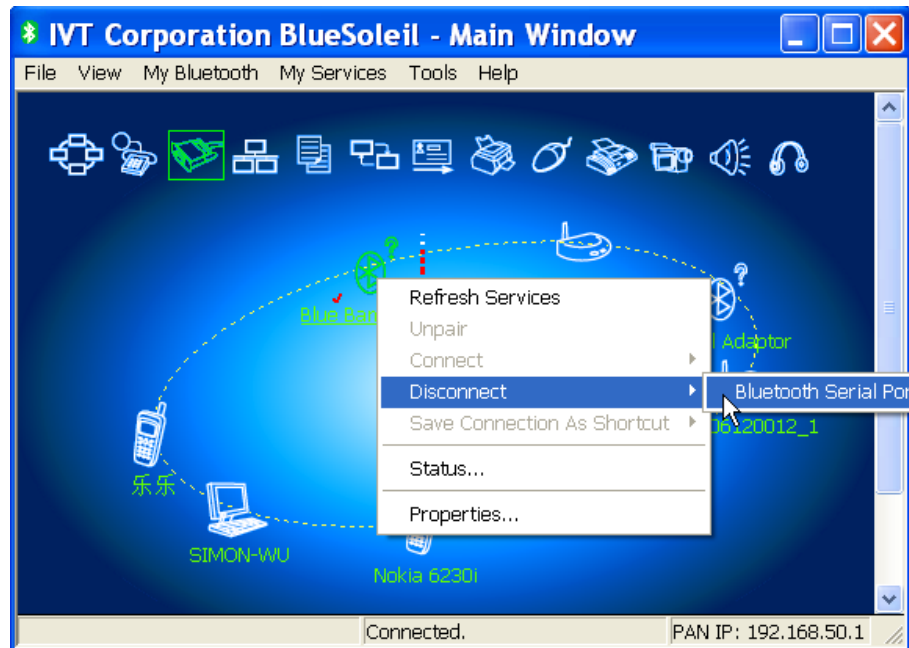


Figure 72