BIRCH®

User's Manual

BP003

Let your printing Easy and Magic

Thermal Receipt Printer



Important Safety Instructions

Be sure to have read the manual carefully before your operation. Neither our Corporation nor its affiliates shall be liable to the purchaser of this product or third parties for damages, losses, costs, or expenses incurred by purchaser or third parties as a result of: accident, misuse, or abuse of this product or unauthorized modifications, repairs, or alterations to this product, or failure to strictly comply with our Corporation's operating and maintenance instructions.

- ❑ Follow the notices and warnings carefully to avoid seriously bodily injury.
- ❑ Don't touch the thermal head with your hand and other solid object at any moment to avoid your body burned or the thermal head damaged.
- ❑ Be careful the dentate cutter when you replace the paper.
- ❑ You are forbidden to clean the printer with alcohol or other liquid when the printer is connected to the power, pull the plug out when which is processed, using the soft cloth instead of the hard object.
- ❑ Please don't use the printer near the water.
- ❑ Make sure that the printer is connected to a reliable power outlet. It should not be on the same electric circuit as copiers, refrigerators, or other appliances that cause power spikes.
- ❑ Make sure the printer is far away from the appliance that can arouse electromagnetic jam, such as loudhailer.
- ❑ The power outlet you plan to connect to should be nearby and unobstructed.
- ❑ Make sure that the surrounding area is clean, dry, and free of dust and not exposed to direct sunlight.
- ❑ Don't remove the printer's out-cover and repair the printer. When needed, call or take it to the professional.
- ❑ Make sure to set the power switch OFF when connects the printer to the power or computer.
- ❑ 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.

  (2) This device must accept any interference received, including interference that may cause undesired operation.

  The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.
- ❑ When the following error or problem occurs, please contact the professional or dealer:

  A: The power cable is damaged or broken.

  B: The printer is sloppy by some liquid.

  C: The printer didn't work when you operate according to the manual.

  D: The printer out-cover is broken.

  E: The specification or print quality is going wrong obviously, it needs repaired.



Warning: In order to ensure the use life of printer, strictly prohibit printing full line full black exceeding 2 CM.

Notice: The contents of this manual are subject to change without notice.

***All the parts of the printer can be recycled. When it is abandoned, we can call it back freely. Please contact us when you abandon it.**

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Chapter 1 Overview

1.1 Features

BP-003 printer is a kind of high-speed mini thermal printer. It is a high-quality, high-reliability and low-noise POS printer and operated easily, which can be widely used in ECR, PC-POS and BANK POS for printing a variety of receipt.

1.2 Part Description

According to different data port (interface), BP-003 serials are divided into several different names:

BP-003BP is the printer equipped with parallel interface, BP-003BR is equipped with serial interface and USB interface and with serial cable, BP-003BU is equipped with serial interface and USB interface and with USB cable, BP-003BN is equipped with Ethernet interface and USB interface and with LAN cable.

BP-003 series printer is equipped with auto cutter, it has two kinds of cutter for the consumer to selected: partial cutter can only cut the paper with one point left while full cutter cuts the paper fully.

	Parallel interface	USB + Serial interface	USB + Ethernet interface
MODEL	BP-003BP	BP-003BR BP-003BU	BP-003BN

Note: Please contact the dealer for changing the interface if needed.

1.3 Parts Identification

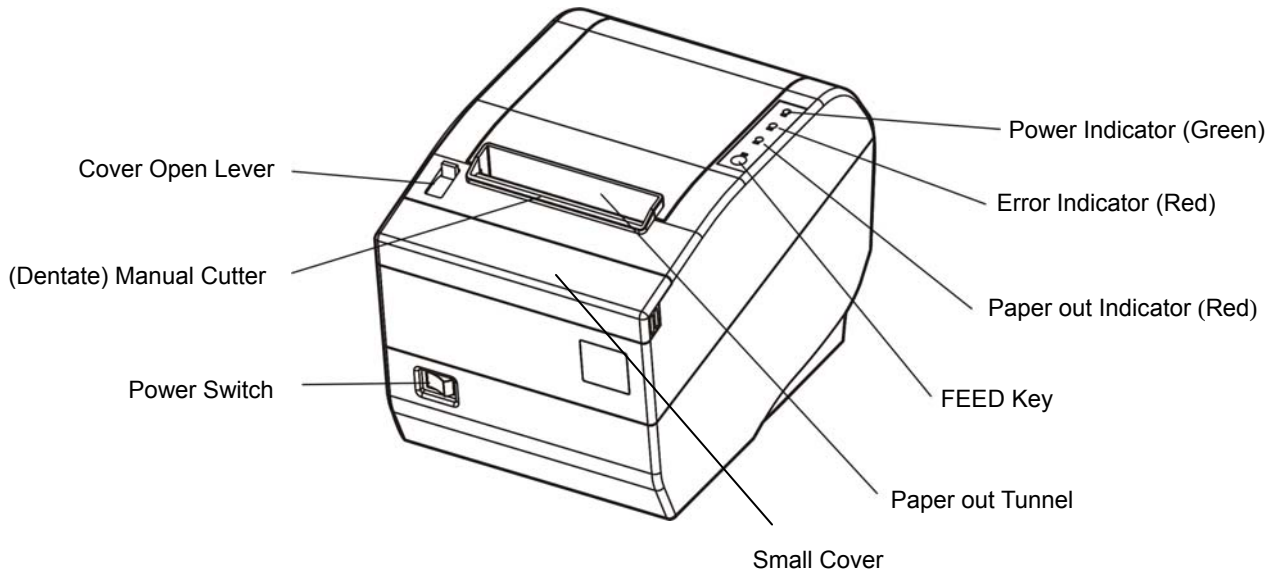


Fig 1-1 Main parts of the printer

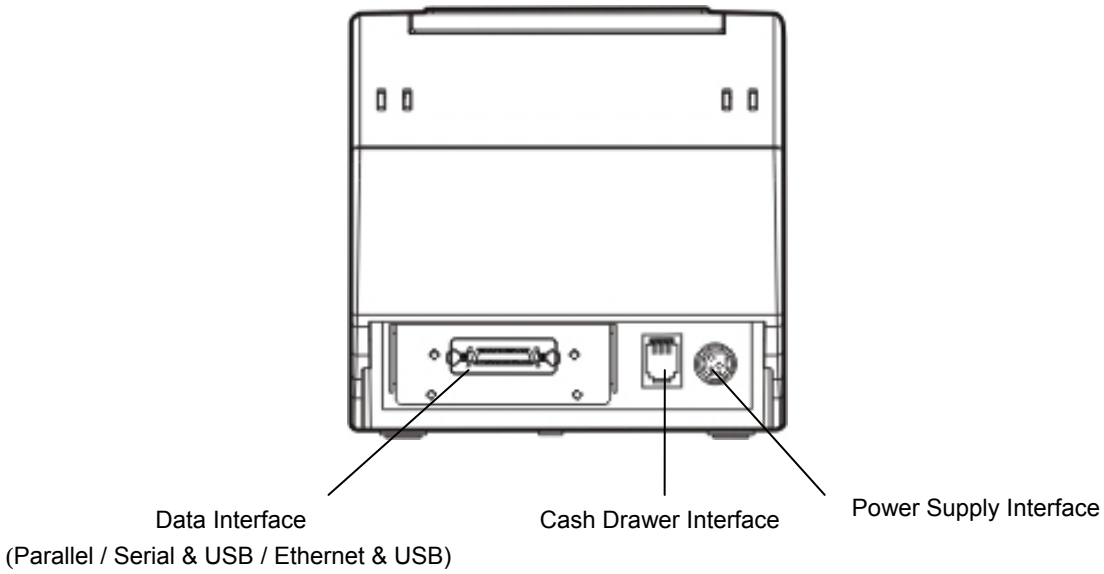


Fig 1-2 Back of the printer

★ According to specific interface standards

Chapter 2 Installing the Printer

2.1 Unpacking & Checking

Check each item against the following packing list. If any of these items is missing, please contact your dealer.

The interface cable is optional, which will be equipped by the customer's request.

★ **Interface cable is an optional part, it is selected as client's requirement.**



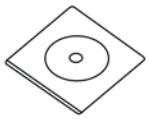
Printer



Power Cord



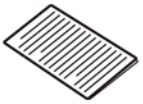
Interface Cable



Driver CD
(Includes Windows Driver and *User's Manual*)



AC Adapter



Facility User's Guide

Fig 2-1 Packing List

Note: You should check the items according to the packing list and they are subject to change without additional notice.

2.2 Unpacking the Protective Materials

1. Open the packing box, lift up the printer.
2. Save all the original packing materials, so that it can be used when transport the printer.

2.3 Connecting to Your Computer or Other Equipment

The printer can be configured with parallel interface, serial & USB interface or Ethernet & USB interface and Cash drawer interface. (According to specific interface standards)
Connect the printer to your computer as described below.

Note: Before connecting or disconnecting the interface cable, make sure that power to the printer and all the devices connected to the printer are turned off. Also make sure the power cable plug is disconnected from the AC outlet.

2.3.1 Connecting the Parallel Interface Cable

1. Make sure the host and the printer are both turned off, connect the parallel interface cable to the connector on the rear panel of the printer, fasten the wire clips as shown in Fig 2-2.

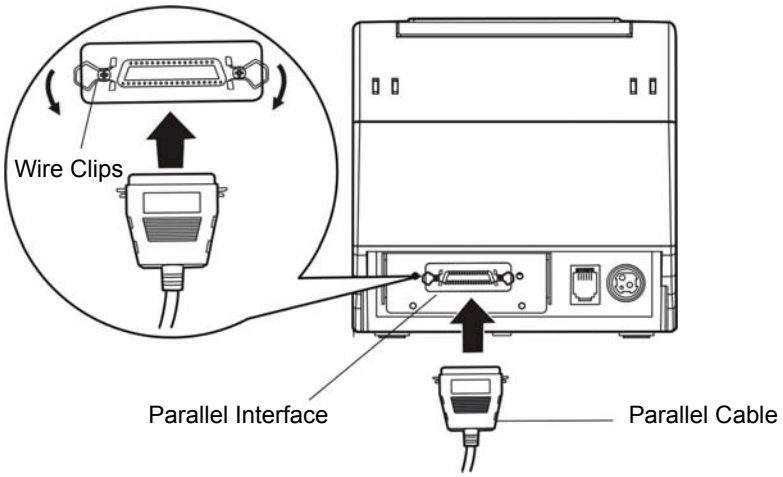


Fig 2-2 Connecting the parallel interface cable

2. Connect the other end of the cable to the host. Tighten the connector screws.
3. This printer can carry out a network printing through connecting parallel interface to network print server, which you can use are PS-1206, SX-110 and SX-3100 that have been validated.

2.3.2 Connecting the USB Interface Cable

1. Plug the USB cable A end (flat shape) into the computer's USB interface as shown in Fig2-3.
2. Plug the USB cable B end (square shape) into the printer's USB interface.

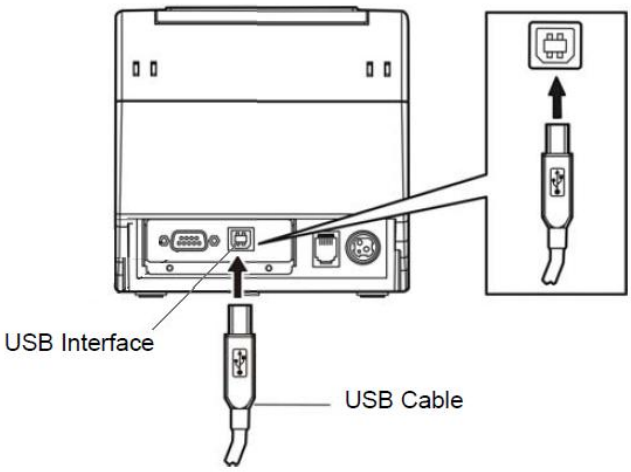


Fig 2-3 Connecting the USB interface cable

Note: Please take the reference to the *user's manual* about the specification of Internet's setting of the Ethernet's printer.

2.3.3 Connecting the Serial Interface Cable

1. Make sure the host and the printer are both turned off, connect the serial interface cable to the connector on the rear panel of the printer. Tighten the connector screws as shown in Fig 2-4.

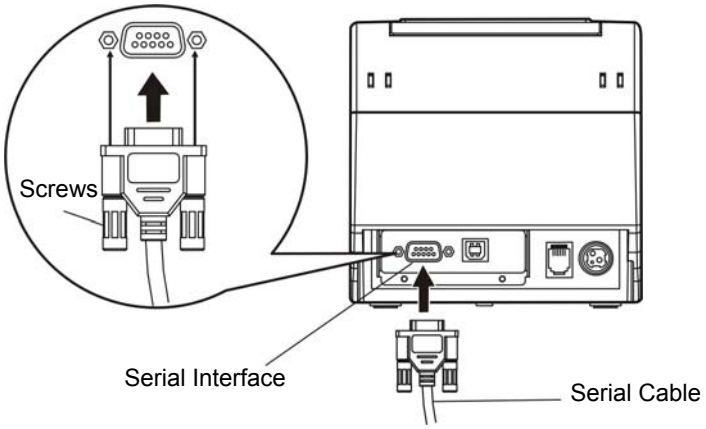


Fig 2-4 Connecting the serial interface cable

2. Connect the other end of the cable to the host's serial interface and tighten the connector screws.

2.3.4 Connecting the Ethernet Cable

1. Plug the crystal end of the Ethernet cable (RJ-45) into the printer's Ethernet interface as shown in Fig 2-5.
2. Plug the other end of the Ethernet cable (flat) to the LAN's entrance.

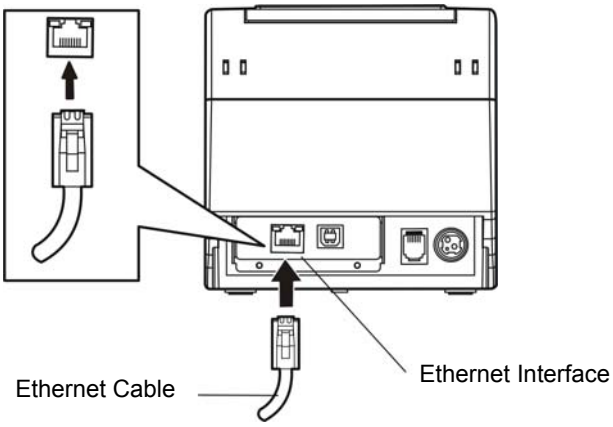


Fig 2-5 Connecting the Ethernet cable

2.3.5 Connecting the Cash Drawer Cable

Turn off the printer and plug the cash drawer cable into the cash drawer interface on the back of the printer as shown in Fig 2-6.

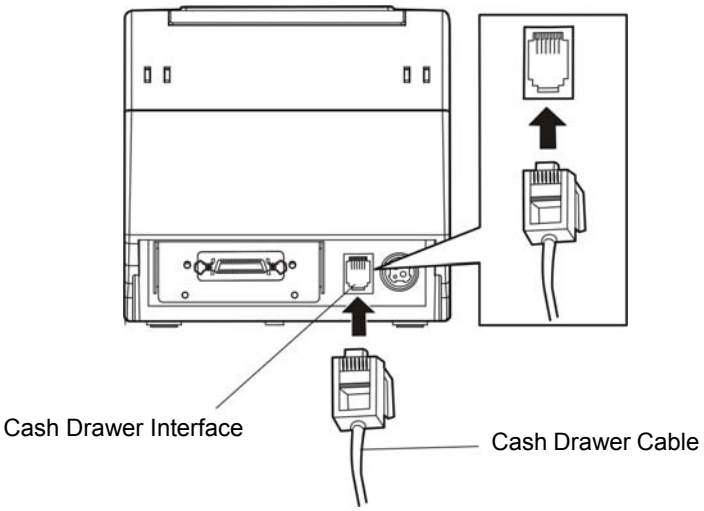


Fig 2-6 Connecting the cash drawer cable

Caution: You must use the appropriate cash drawer, or else our company will not guarantee to keep the printer in good repair when it is damaged by improper cash drawer.

2.4 Connecting the Power Cord

1. Make sure the printer's power switch is turned off. Plug the AC adapter's supply cable as shown below. Connect the AC adapter to the power cord.
2. Make sure the voltage of the electrical outlet matches that of the AC adapter.
3. Plug the AC adapter to the printer's power supply interface.
4. Plug the power cord one end to the AC adapter and the other to the electrical outlet with ground wire.

Note: 1. If the rated voltage doesn't match the outlet voltage, contact your dealer for assistance. Do not plug in the power cord.

2. Please use the exactitude electrical outlet with ground wire.

3. Please use original AC adapter, our company will not guarantee to keep in good repair, when it is damaged by unauthorized AC adapter.

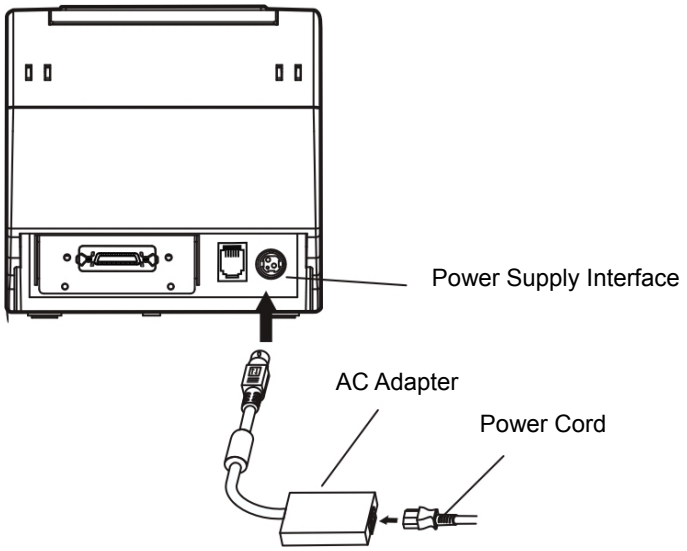


Fig 2-7 connecting the AC adapter

2.5 Installing the Print Driver and Selecting the Cutter

You must setup the printer driver in Windows before using the BP-003 printer.

Please use the cable to connect computer with printer, then turn on the computer and the printer, put the driver CD into the CD-ROM. Install driver by the following ways:

Auto-install way

Double click the file "Setup.exe" in the driver disc, install driver by the following direct.

Note: Auto-install way needs the operating system of Windows 2000 or above.

Hand operated installing way

Note: The hand-operated install ways of serial interface and parallel interface are the same.

1) The installing steps of parallel interface for Windows 2000/XP/Vista are as follows:

1. Click "Start" → "Settings" → "Select Printers".
2. Click "Add Printer", then it will show a window of "Add Printer Wizard", click "Next", then please read the select direct carefully, such as, select "Local printer" in the "Local or Network Printer" window, then click "next".
3. Come out a window of "Select the Printer Port", select a usable port. Such as, select "LPT1:

printer port", click "Next".

4. Come out a window of "Manufacturers/Printers", click "Have Disk...".
5. Come out a window of "Install From Disk". Please according to the operating system environment, you should select the path as follow: CD-ROM-"Driver"-"WIN2000 (XP-Vista-Win7)", which you can find a file named: BP003.inf, click "Open", then click "OK" to return to the window of "Manufacturers/Printers", click "Next".
6. Follow the direct click "Next" gradually till the installation is finished.

2) The installing steps of parallel interface for Windows 7 are as follows:

1. Click "Start" → "Settings and Printers".
2. Click "Add Printer", then it will show a window of "Add Printer Wizard", click "Next", then please read the select direct carefully, Such as, select "Local printer" in the "Local or Network Printer" window, then click "next".
3. Come out a window of "Select the Printer Port", select a usable port. Such as, select "LPT1: printer port", click "Next".
4. Come out a window of "Manufacturers/Printers", click "Have Disk...".
5. Come out a window of "Install From Disk". Please according to the operating system environment, such as Windows XP operating system you should select the path as follow: CD-ROM-"Driver"-"WIN2000 (XP-Vista-Win7)", where you can find a file named: BP003.inf, click "Open", then click "OK" to return to the window of "Manufacturers/Printers", click "Next".
6. Follow the direct click "Next" gradually till the installation is finished.

The USB interface installing steps for Windows 2000/XP/Vista/Win7 are as follows:

The following steps are used Windows XP as example. There are slight differences among different operating systems.

1. Connect an USB cable and turn on the printer.
2. After the computer find out new hardware and finish searching, come out a window of "Found New Hardware Wizard", choose "Install from a list or specific location (Advanced)", click "Next".
3. Come out a window of "Add New Hardware Wizard"-"Windows operation", choose "Don't search, I will choose the driver to install", click "Next".
4. Come out a window of "Hardware Type", select "Printers", click "Next". Come out a window of "Manufacturers/Printers", click "Have Disk...".
5. Come out a window of "Install From Disk". Please according to the operating system environment, you should select the path as follow: CD-ROM-"Driver"-"WIN2000 (XP-Vista-Win7)", where you can find a file named: BP003.inf, click "Open", then click "OK" to return to the window of "Add Printer Wizard", click "Next".
6. Follow the direct click "Next" gradually till the installation is finished.

The installing steps for Windows 98 are as follows:

（1）The installing steps with a parallel cable or a serial cable:

1. Click "Start" → "Settings" → "Printers".
2. Click "Add Printer", then it will show a window of "Add Printer Wizard", click "Next", then please read the select direct carefully, Such as, select "Local printer" in the "Local or Network Printer" window, then click "Next".
3. Come out a window of "Click the manufacturer and model of your printer", click "Have Disk...", please click "Browse", select the path as follow: CD-ROM-"Driver"-"WIN98 (WINME)", where you can find a file named:BP003.inf, click "Open", then click "OK".
4. Come out a window of "Install From Disk", click "OK", return to a window of "Add Printer", then click "Next".
5. Come out a window of "Printer port", select "Available ports", Such as, select "LPT1: Printer Port", click "Next", and then show the printer's name. If the system is not installed by other printer driver process, the printer is treated as default printer by the application process of Window98 environment, click "Next". Otherwise according to prompt, choose the printer is default: "Yes",

click "Next", choose "Yes-(recommended)", click "Finish". Come out a window of "Printer test page completed", click "Yes".

6. The printer driver process is installed successfully.

（2）The installing steps with an USB cable:

Note: 1. As the system of Windows 98/ME doesn't have integrated USB driver control, please install USB driver before using USB interface printing. Then install USB printer driver.

2. If it has installed the USB driver, please install the USB printer driver directly as the following steps.

USB driver installing steps:

1. Connect an USB cable and turn on the printer.
2. After the computer find out new hardware and finish searching, come out a window of "Add New Hardware Wizard", click "Next".
3. Come out a window of "Add New Hardware Wizard"-"Windows operation", choose "Search the best driver for the device (recommended)", click "Next".
4. Come out a window of "Search for new drivers", check "Specify a location", click "Browse", select the path as follows: CD-ROM-"Driver"-"【WIN98 (WINME) \USBdriver】", then click "OK".
5. Return to a window of "Search for new drivers", click "Next"; Come out a window of "Windows driver file search for the device", click "Next".
6. After the system finishing installing the file automatically, come out a window of "USB Print Supported", click "Finish".
7. The printer USB driver process is installed successfully.

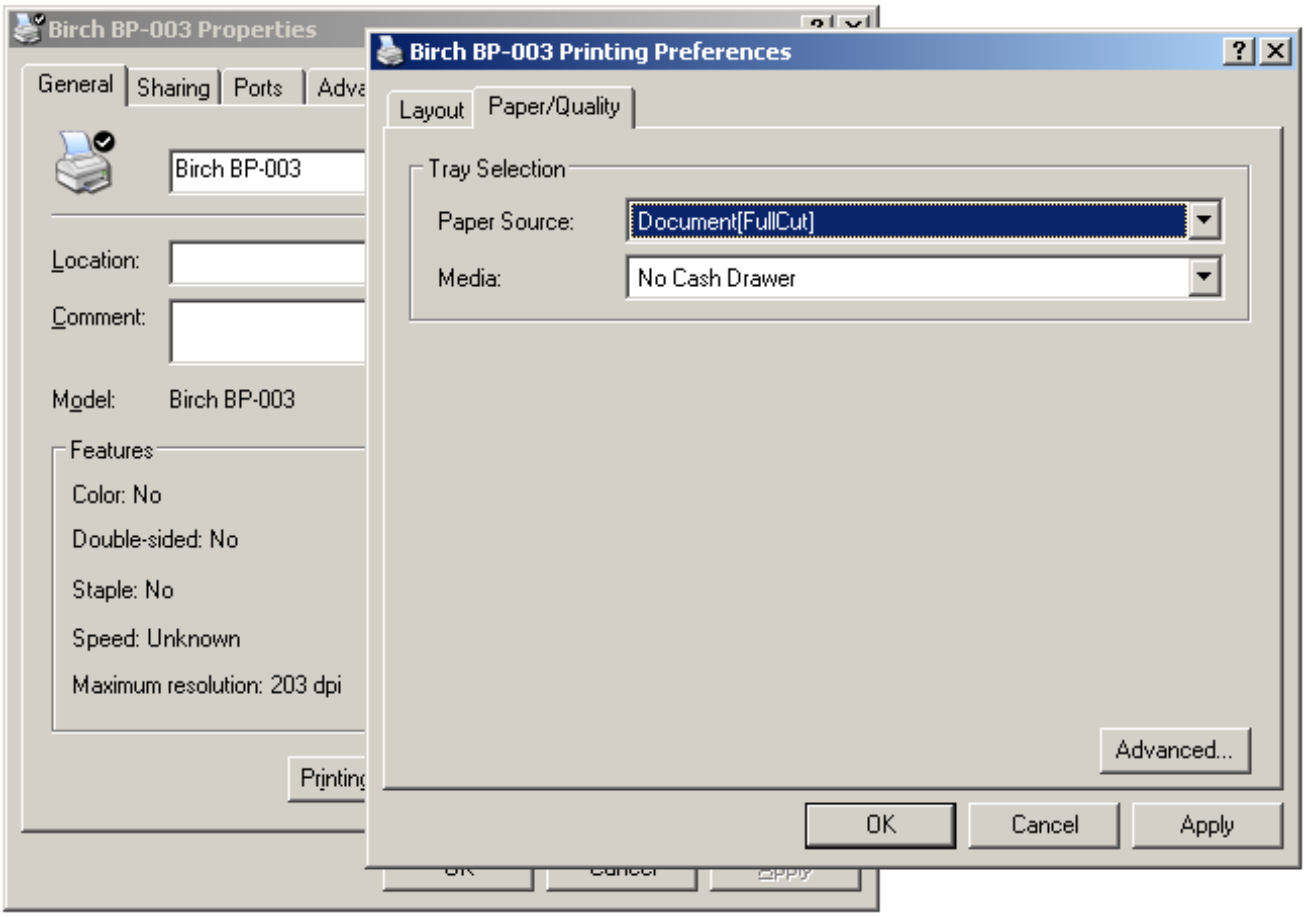
USB printer driver installing steps:

1. Click "Start" → "Settings" → "Printers".
2. Click "Add Printer", then it will show a window of "Add Printer Wizard", click "Next".
3. Come out a window of "Click the manufacturer and model of your printer", click "Have Disk...", please click "Browse", select the path as follow: CD-ROM-"Driver"-"WIN98 (WINME)", where you can find a file named: BP003.inf "Open", and then click "OK".
4. Come out a window of "Install From Disk", click "OK", return to a window of "Add Printer", then click "Next".
5. Come out a window of "Printer port", select "Available ports", select "JMUSB", click "Next", and then show the printer's name. If the system is not installed by other printer driver process, the printer is treated as default printer by the application process of Window98 environment, click "Next". Otherwise according to prompt, choose the printer is default: "Yes", click "Next" choose "Yes-(recommended)", click "Finish". Come out a window of "Printer test page completed", click "Yes".
6. The printer driver process is installed successfully.

Please setup the driver following the setup description in the CD going along with the printer. What's more, you can use the TM-T88II, TM-T88III serials driver from EPSON.

If you want to cut the paper after printing, please select the "Full cut" or "Partial cut" in the Paper/Quality page after clicking the "Printing Preferences" button, which lies in the "General" page of the driver properties. Referring figure is shown below.

It is noted that if paper cut effect is the same whichever you select "full cut" or "partial cut" in the driver properties, which means that the cutter (the printer equipped with) can only carry out one kind of cut-methods.



2.6 Network Settings

Please use Birch network setting software NetFinder to set the IP address for Jolimark printers, which can be found in the CD or downloaded from www.birch.com.tw

Caution: The network printing function needs the operation system of Windows2000 or above.

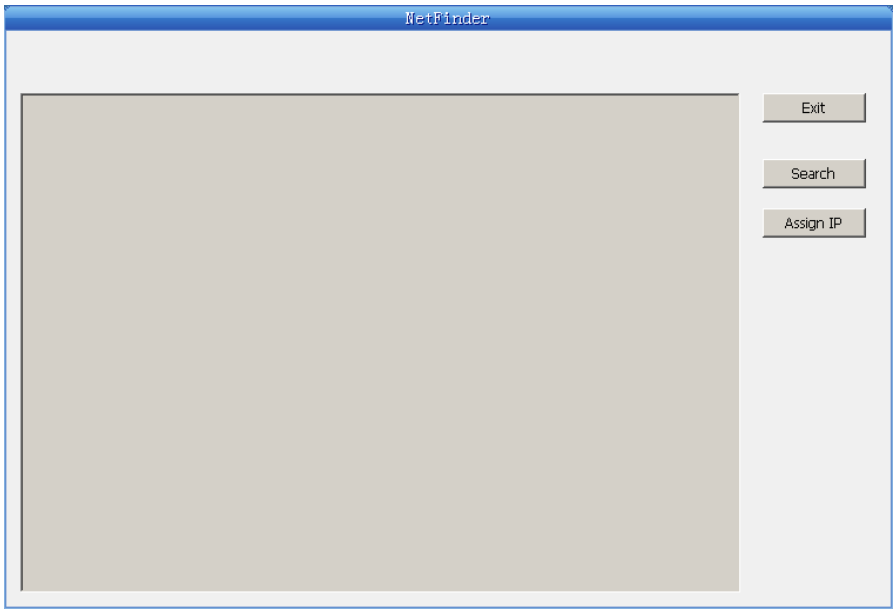
2.6.1 Connecting Printer

Power on the printer, connect with the Ethernet cable which has been connected to LAN, and look into the information of Ethernet LED indicator to ensure the printer has entered into the normal connection.

Yellow LED	Green LED	Description
ON	Blink	Normal
OFF	OFF	Not connecting to network

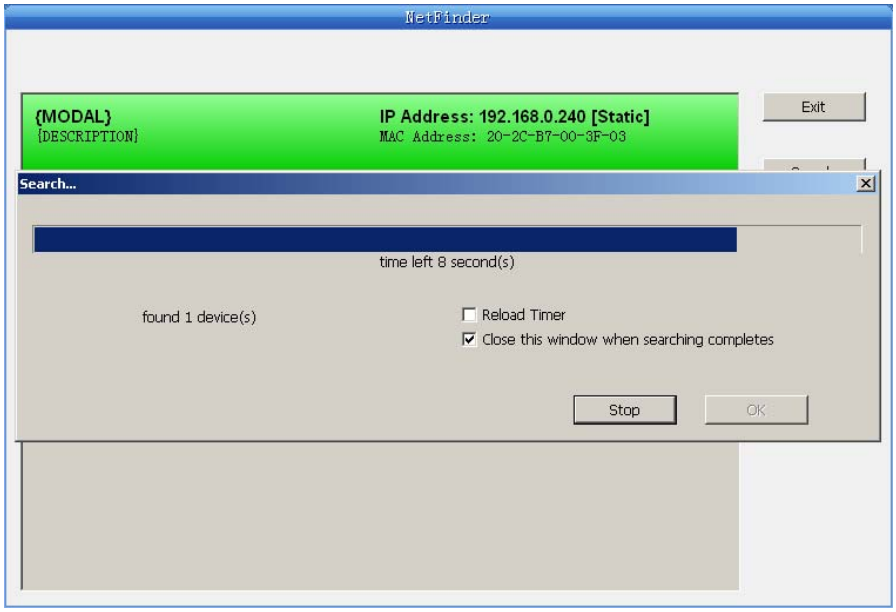
2.6.2 Setting IP Address

1. Run NetFinder Software
   Double click NetFinder.exe in the PC which connects the printer in the same LAN. The figure of the software is shown as follows:



Button description:
Exit—Exit from the software
Search—Search printers in the same LAN
Assign IP—Modify the IP address and other settings for the specified printer.

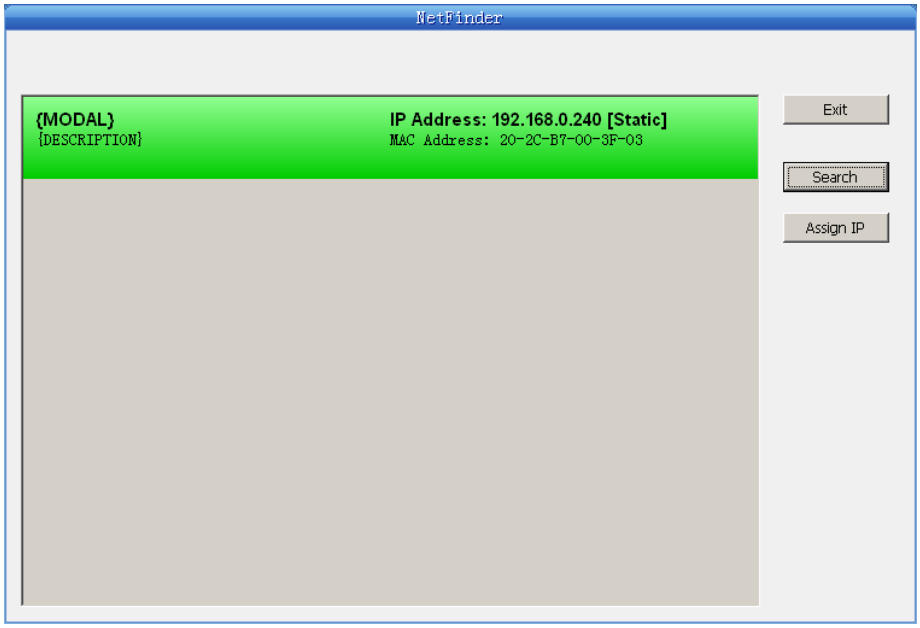
2. Search printer
Click "Search" button in the main interface, the dialog box appearing will begin searching automatically and show appearance, listing a printer in the main interface if found. The time is counting down in the progress bar (10s in total) and the search will finish as soon as the time is over. When going on searching, press "search" button again.



If the printer still can not be found out when the network connection is correct in the same network, Please check whether the network fire wall on the PC open or not. If there is fire wall, please close it temporarily, open again after finishing searching and setting a printer completely.

3. Setting printer's IP address
The printer's information is listed in the main interface, the left side of which is the model and

description and the right is the IP and MAC address. What's more, the assign mode (dynamic/static) is noted behind the IP address.



1) Correlative description for IP address settings

In order to search and set printer's IP address conveniently for the first time, the factory default setting is DHCP mode which assigns IP address dynamically. If there is no DHCP server in the connected LAN and printer is set to DHCP mode as well, then it will use the internal pre-set address (IP: 10.0.0.1, Subnet Mask: 255.255.255.0) automatically.

It is suggested that printer's IP set to static in actual usage, which can cut down the time when initializing the Ethernet interface as the printer is turned on and prevent IP conflicts (The dynamic address used in printer may conflict with another one). The network segment part of the IP address and Subnet Mask must be the same as those of PC connecting with a printer. For example, the address of working PC is 192.168.0.1/255.255.255.0 (IP/Subnet Mask), then which of printer should be set to 192.168.0.x/255.255.255.0（x=2~254 and should avoid the IP in used.

It is not restricted for NetFinder to search printers in the same network but different segment parts (can not stride gateway). Relative glossary of IP address may refer to corresponding information.

2) Setting printer's IP address

Select the printer information to be modified (black frame appears), click "Assign IP" button. Set the IP in the dialog box appearing.

Check the "Use DHCP" if need to assign dynamic address, the settings above will be disabled automatically. Please make sure there is a DHCP server in the network, or the printer can not receive an effective IP address.

When to specify static address, uncheck "Use DHCP" and fill in "IP address", "Subnet Mask" and "Default Gateway". If there is no gateway in the network, fill 255.255.255.255 in the "Default gateway". "IP address" and "Subnet Mask" should obey the assigning rules of local LAN (Ethernet), please enquire the administrator of networks which the printer connects to for more details.

Click "OK" to send address setting information to the specified printer. The printer takes response after "Close this window on success" is checked, and then this dialog is closed automatically. Select "Reload Timer" then the software will wait for the printer's response. Generally, printer will take response in a circle time if network connection is correct.

Click "Cancel" if you abandon the modification.

Click "Search" in the main interface again to update printer information after modifying the printer's IP address.

3) Report printer's IP address

Report the printer's IP address, which will be used in the section "Newly-install printer network

driver" or "Upgrade-install printer network driver (setting driver's network port)".

2.6.3 Installing Printer Network Driver

The ways of installing network driver are divided into Newly-install way and Upgrade-install way according to whether the PC installs the printer driver or not.
If the printer driver hasn't been installed on the PC, adopt newly-install way whose steps are shown in "Newly-install printer network driver".
If the printer driver has been installed on the PC, adopt Upgrade-install way whose steps are shown in "Upgrade-install printer network driver".

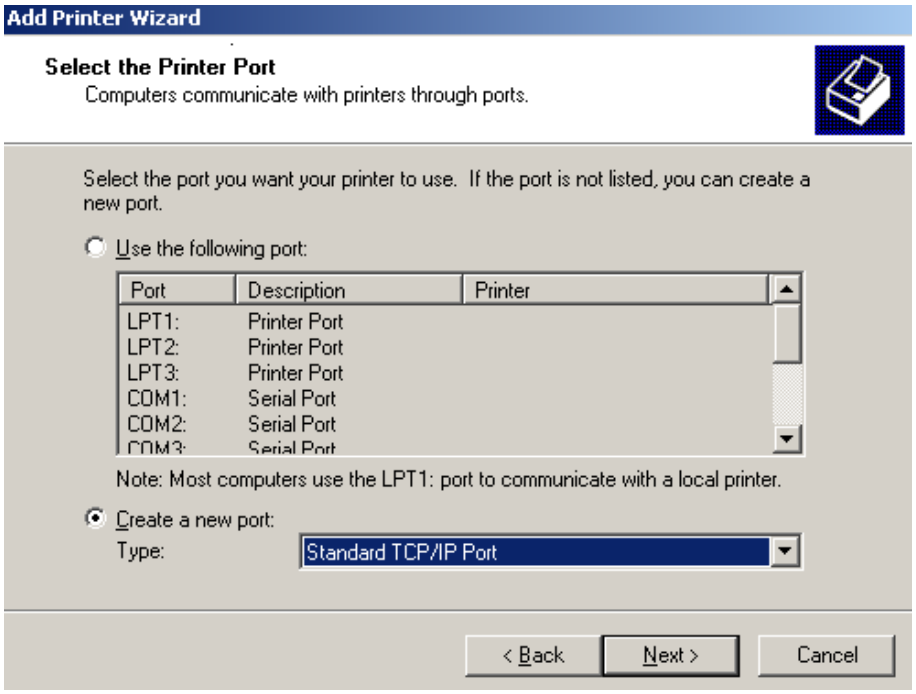
1. Newly-install printer network driver

1) Click "Start" → "Settings" → "Select Printers".

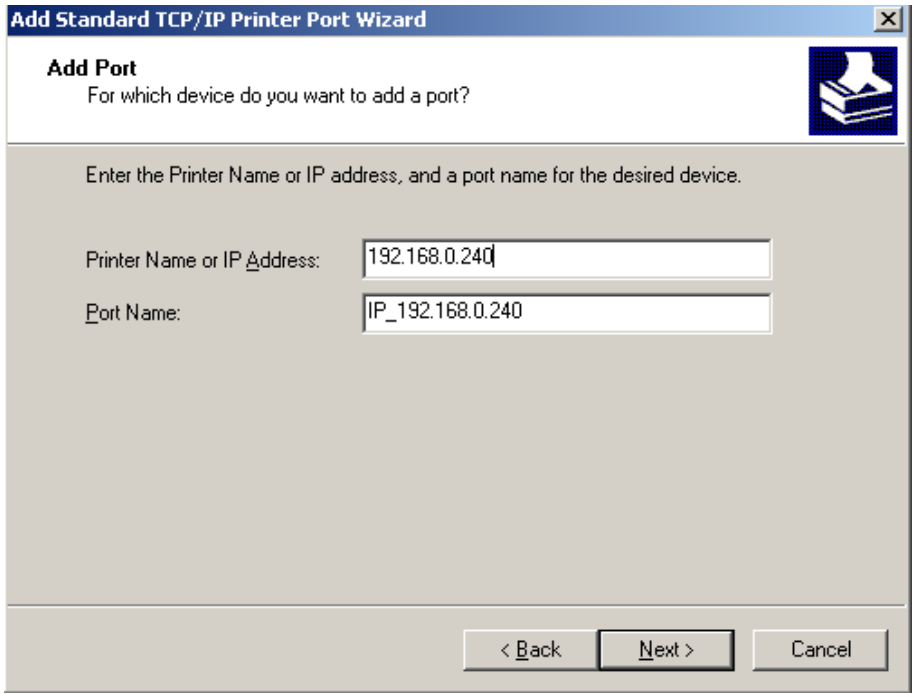
2) Click "Add printer", then come out a window of "Add Printer Wizard", click "next", then please read the select direct carefully. Such as, select "local or Network Printer", then click "next".

3) Come out a window of "Select the Printer port", select a port you want your printer to use. For example, select "Create a new port", select "Standard TCP/IP Port" in the port, click "next".

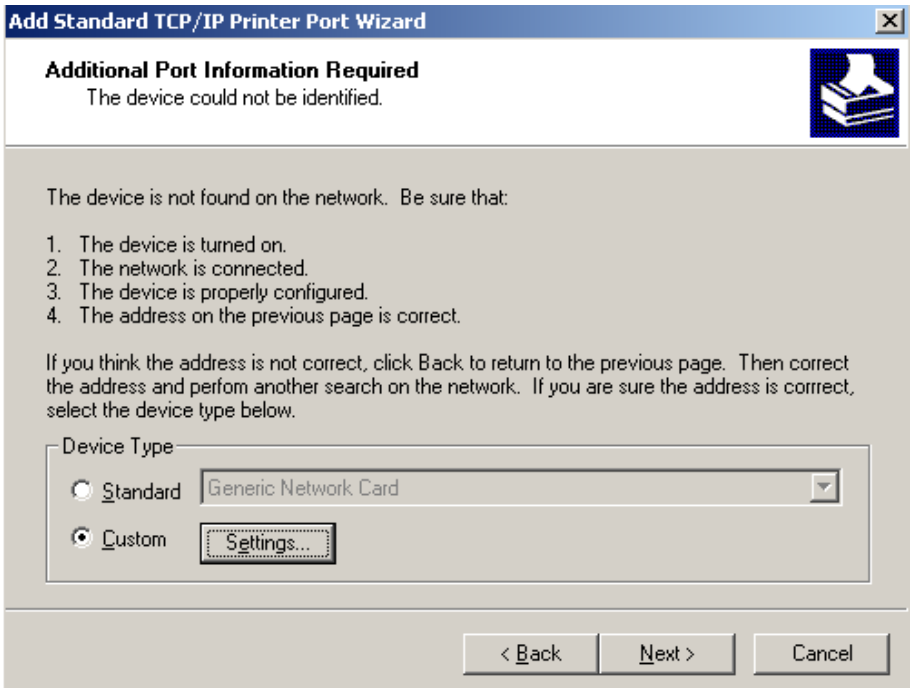
4) Come out a window of "Add standard TCP/IP Printer Port Wizard", click "Next".



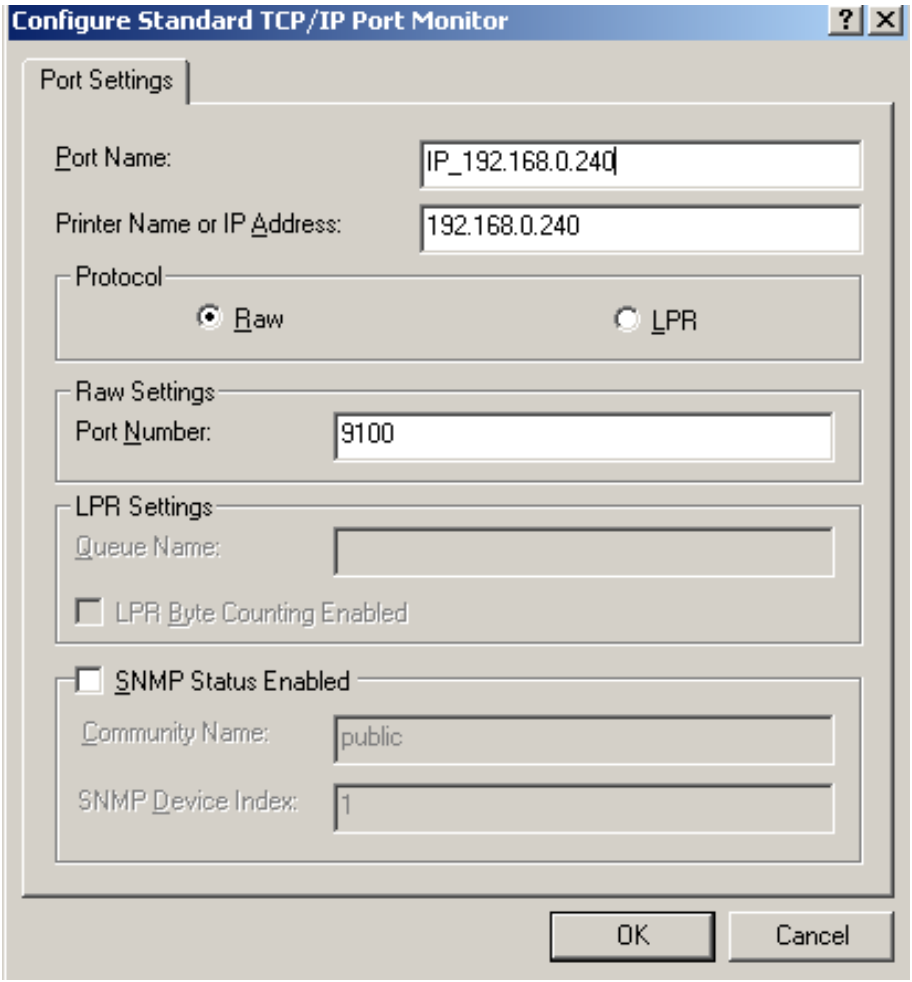
5) Come out a window of "Add Port", enter the IP address reported by the "Setting printer's IP address" in the "Printer Name or IP Address" column. Take IP address "192.168.0.240" for example. "Port Name" is created automatically after finishing filling in IP address.



6) Come out a window of "Additional Port Information Required", select "Custom" in the "Device Type", then click "Settings".



7) Come out a window of "Port Settings". Affirm that "Port name" and "Printer name or IP address" are correct, "Protocol" is "RAW" and "Port Number" is "9100", click "OK".



8) Return to "Additional Port Information Required", click "Next".

9) Come out a window of "Completing the Add Standard TCP/IP Printer Port Wizard", click "Finish".

10) In the selection of "Manufacturers/Printers", click "Have Disk", and then click "Next".

11) Come out a window of "Install From Disk". Please according to the operating system environment, such as Windows 2000/XP/Vista/Win7 operating system you should select the path as follows: CD-ROM-"Driver"-"WIN2000 (XP-Vista-Win7)", that you can find a file named: BP003.inf, click "open", then click "OK", then return to the window "install printer software", click "next".

12) Follow the direct click "next" gradually till the installation is finish. At this time, printer network driver is installed completely.

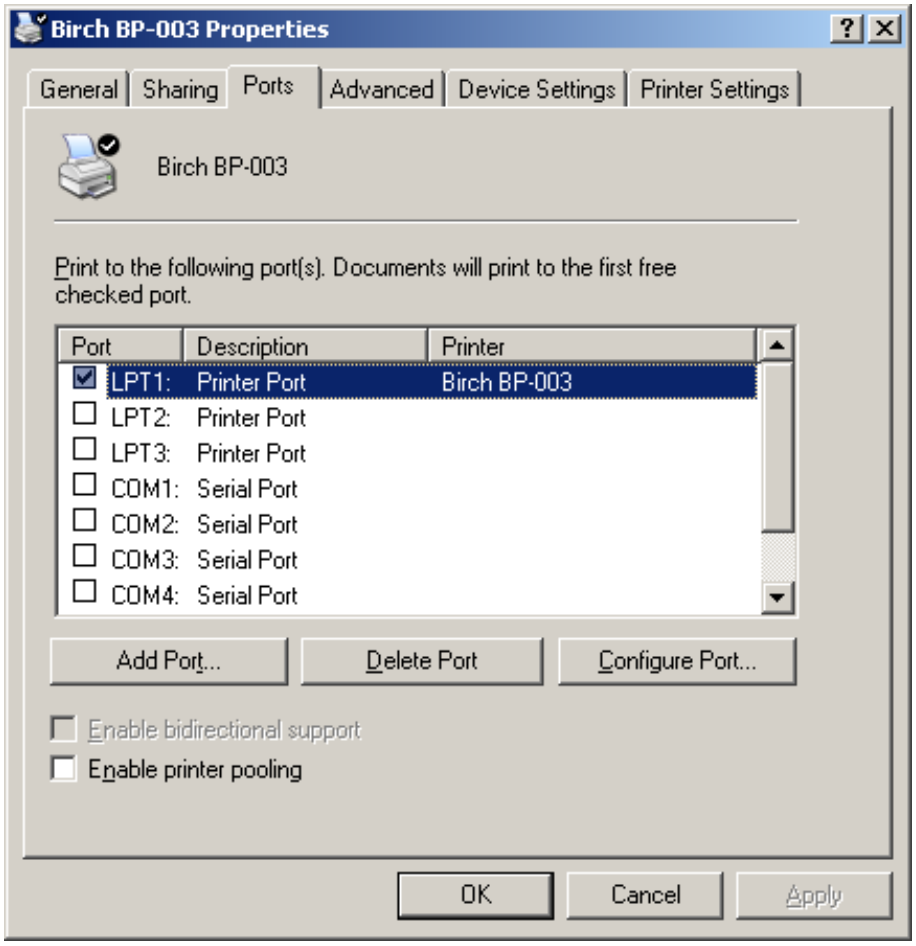
2. Upgrade-install printer network driver (setting driver's network port)

If PC has installed the printer's driver, set driver's network port to carry out network printing. The concrete steps are shown below:

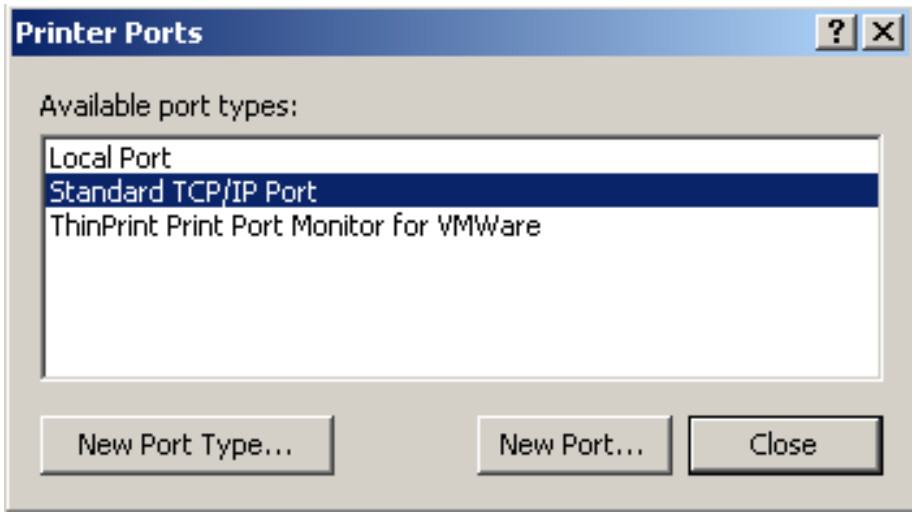
1) Click "Start" → "Settings" → "Select Printers".

2) Right click BP-003 driver, click "Properties" on the window coming out.

3) Come out a window of "Properties", click "Ports" and "Add Ports".

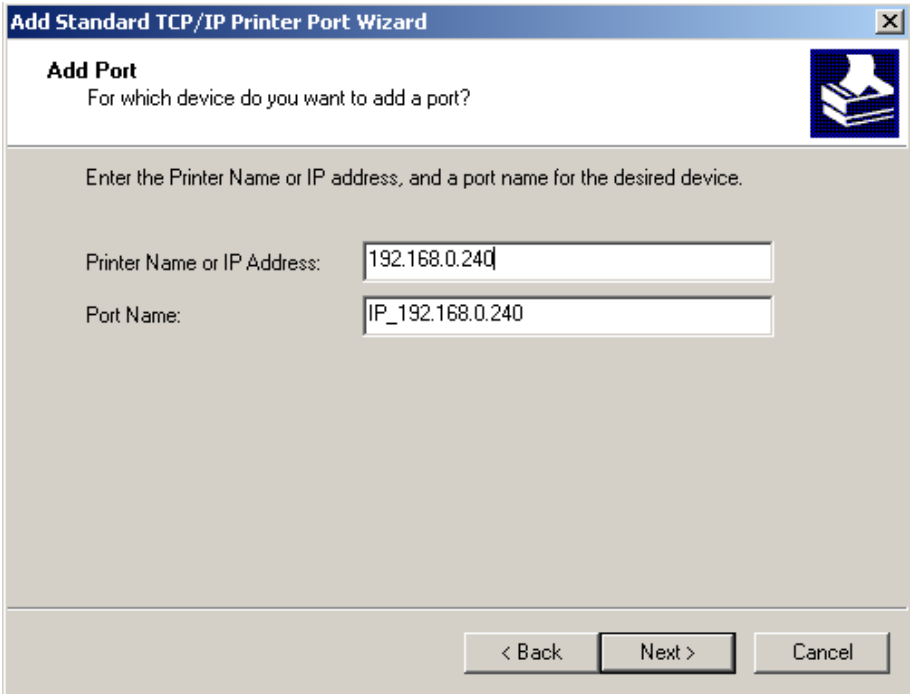


4) Come out a window of "Printer port", select "Standard TCP/IP Port", click "New port".

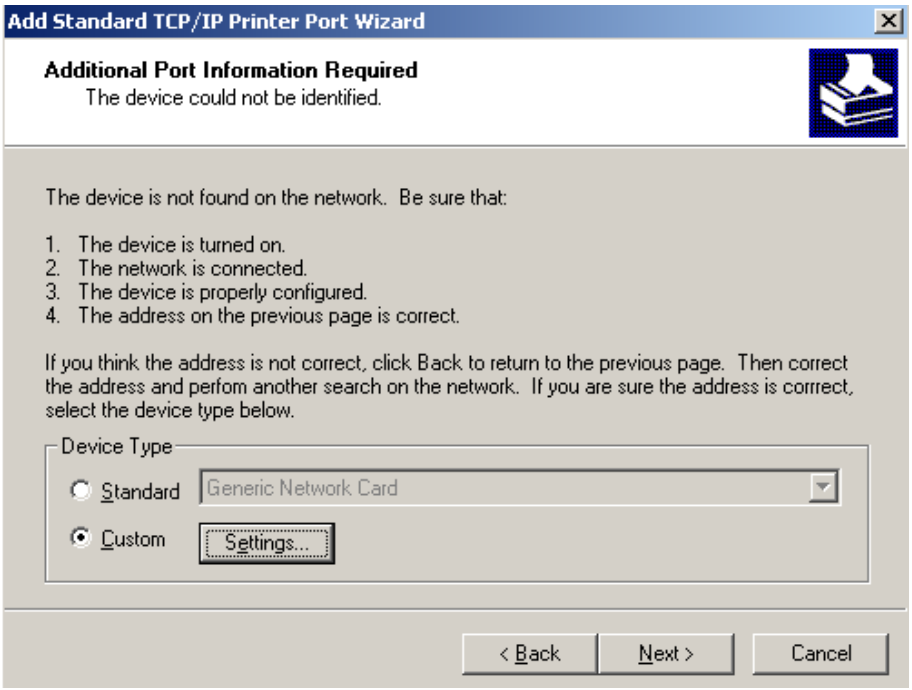


5) Come out a window of "Add Standard TCP/IP Printer Port Wizard", click "Next".

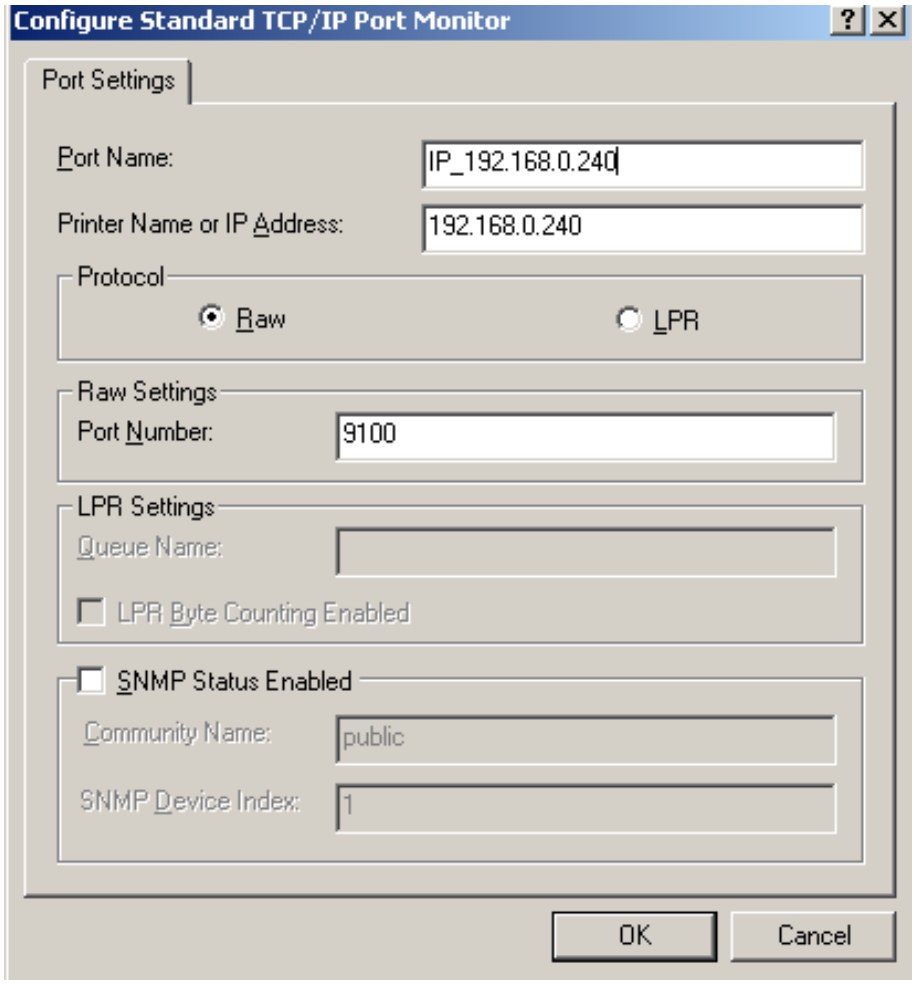
6) Come out a window of "Add a port", import the IP address reported by the "Setting printer's IP address" in the "Printer name or IP address" column. Take IP address "192.168.0.240" for example. "Port name" is created automatically after finishing filling in IP address. Click "Next".



7) Come out a window of "Port information", select "User-defined" in the "Equipment style", then click "setting". Come out a window of "Additional Port Information Required", select "Custom" in the "Device Type", then click "settings".



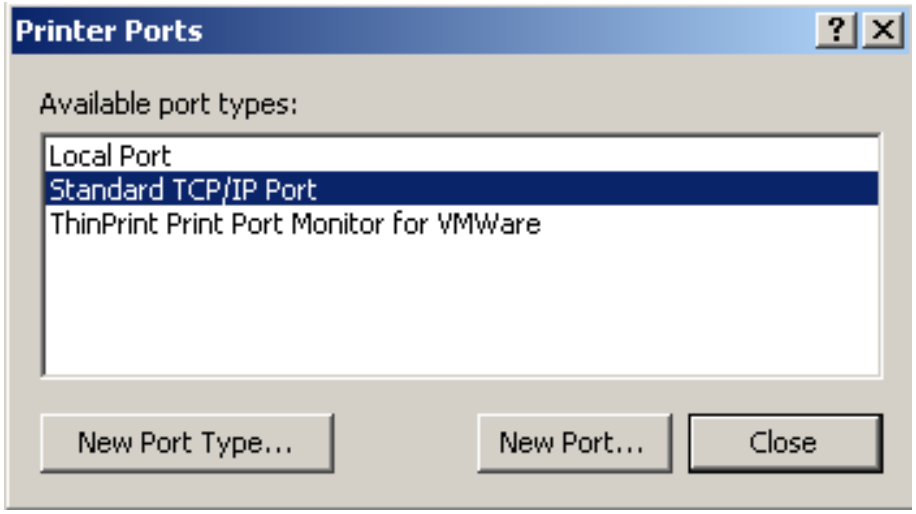
8) Come out a window of "Port Settings". Affirm that "Port name" and "Printer name or IP address" are correct, "Protocol" is "RAW" and "Port Number" is "9100", click "OK".



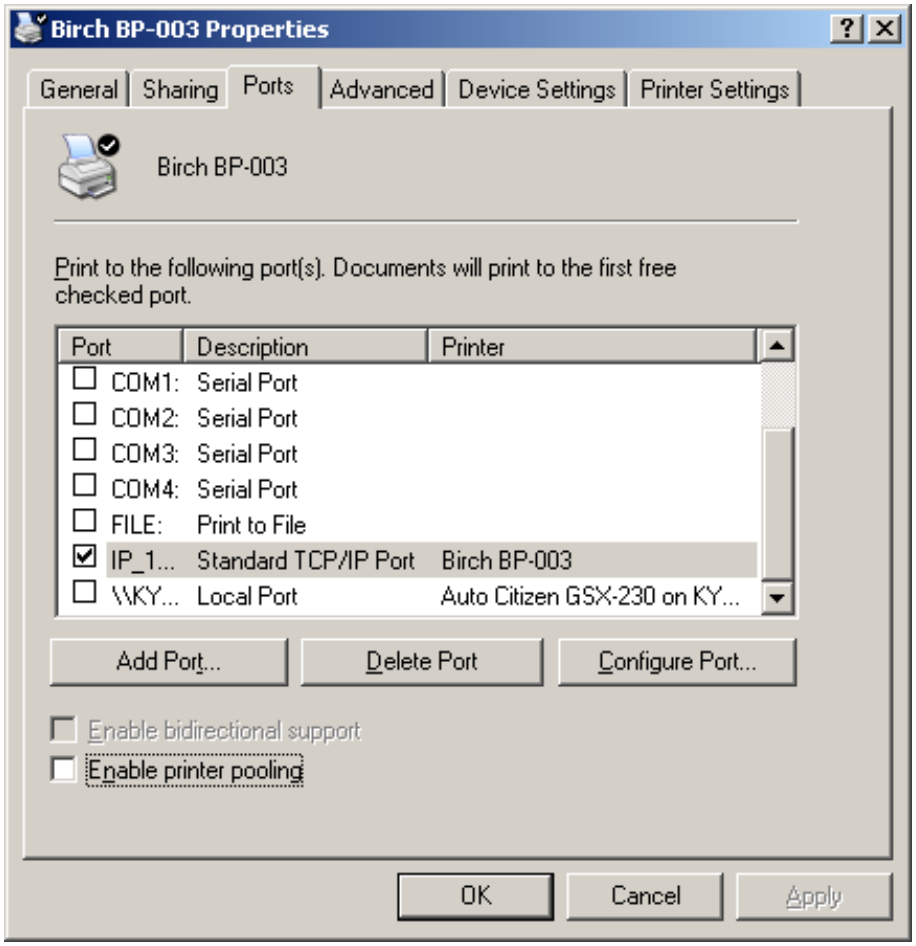
9) Return to "Additional Port Information Required", click "Next".

10) Come out a window of "Completing the Add Standard TCP/IP Printer Port Wizard", click "Finish".

11) Return to "Printer Ports", click "Close".



12) Return to "Properties", make sure the network port is selected, click "Apply", and then click "Close". Thus, printer's network port setting is finished.


Birch BP-003 Properties
General
Sharing
Ports
Advanced
Device Settings
Printer Settings
Birch BP-003
Print to the following port(s). Documents will print to the first free checked port.
Port
Description
Printer
COM1: Serial Port
COM2: Serial Port
COM3: Serial Port
COM4: Serial Port
FILE: Print to File
IP_1... Standard TCP/IP Port Birch BP-003
\\KY... Local Port Auto Citizen GSX-230 on KY...
Add Port...
Delete Port
Configure Port...
Enable bidirectional support
Enable printer pooling
OK
Cancel
Apply

Chapter 3 Control Panel

3.1 Control Panel

There are three light indicators and one key on the control panel shown as Fig 3-1.



Fig 3-1 Control panel

3.1.1 Indicator

Indicator	Description
POWER	Indicates whether the printer's power supply is connected or not. The indicator is on when the power is connected.
ERROR	Indicates printer's state. The indicator is on when the abnormity appears.
PAPER OUT	Indicates printer's paper state. The indicator is on when paper end or is about to end.

*Refer to 6.2 Error message on the control panel

3.1.2 Key

Key	Function
【FEED】	【FEED】controls paper feeding, you can enable or disable the button's function with a command. When enabled, the paper will be fed continuously if you press and hold on it, or stop if you loosen it.

3.2 Self-Printing

Self-printing lets you know if the printer is working properly. If the printer printouts the self-test content normally, it can be indicated that there is nothing wrong with the printer except for the interface connecting to the host. Otherwise, the printer should be repaired.

Hold down the **FEED** button and turn on the power switch while the printer cover is closed. Press **FEED** button and Power on the printer, the **ERROR** indicator blinks once with two beeps (if beeper is installed in the printer), loosen the button, then the printer will print out self-test information such as the software version, update date and interface etc.

3.3 Hex Dump Printing

This function allows you to check whether the connection between the printer and the host or terminal device works properly or not.

The method is that press **FEED** button and power on the printer, the **ERROR** indicator blinks once with two beeps. Go on holding the button for about a second, loosen it after the **ERROR** blinks once again with a beep. Turn off the printer when you want to exit this print mode.

3.4 Restoring Factory Printer Settings

The function is to clear the settings stored in the printer and to restore the factory settings for correlative parameters.

The method is that press **FEED** button and power on the printer, the **ERROR** indicator blinks once with beeping twice at the same time. Do not loosen the button until the **ERROR** indicator blinks once with beeping once in about one second. At this time, turn off the printer and the function takes effect.

3.5 Setting Slip Stitch

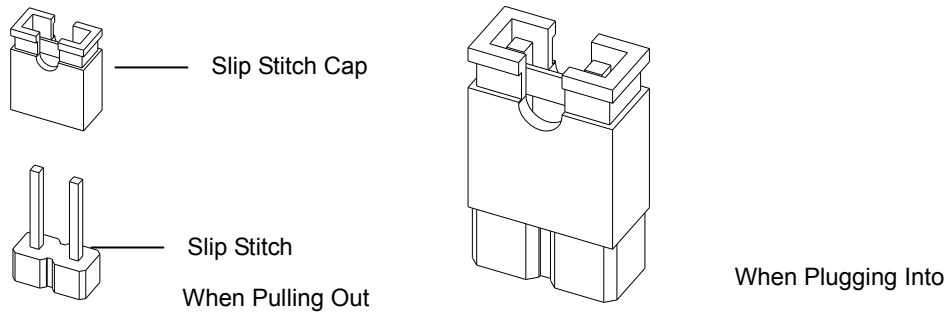


Fig 3-2 Setting slip stitch

If needed, Slip Stitch is used to upgrade printer firmware or it should be closed in normal working condition. When to upgrade, pull out the Slip Stitch Cap after the printer is turned off, press **FEED** button and power on again, the **ERROR** and **PAPER OUT** indicator blinking once at the same time, which indicates that the printer enters into the online-upgrade mode. Loosen the button and then use the computer software equipped with the printer to upgrade. Turn off the printer after finishing upgrading, plug Slip Stitch Cap and then the printer can be working normally.

Note: Do not change the Slip Stitch without any permission of the factory, or the printer can not work.

3.6 Online-aptitude Parameter Settings

BP-003 supports the function of online-aptitude parameter settings, which can be set in the PC with the driver installed in. The parameter settings of serial interface can be modified in the driver's property page.

The concrete setting steps are shown as follows:

1. Make sure that the host and the printer are connected with a cable and both the host and the printer are turned on, the printer should be online as well.
2. Click "Start" → "Settings" → "Printers".
3. Right click "BP-003", select "Properties".
4. Click "Printer settings" in the property page.

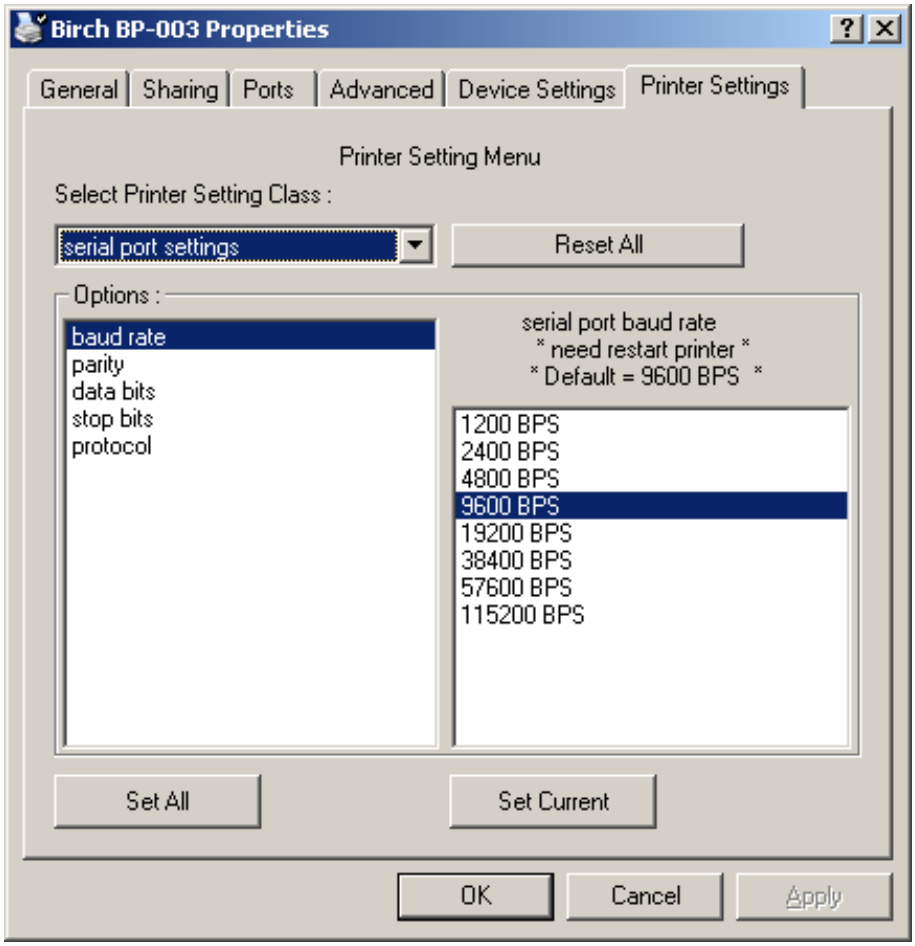


Fig 3-3 Parameter settings

5. Check whether the selected port in the "Ports" is matched with the port connecting to the printer in practical. Return to "Device Property" page layout, the list in the left are the items you want to set and the right are the item's parameters. If you only want to change one item, click "Set Item", or if you want to change multiple items, click "Set All Item" after having set all items. The settings are saved with the printer beeping once.

   Note: The parameter settings shown in the "Device Property" is not the current parameter of the printer.

6. After finishing settings, click "OK", exit the "Properties" window.

7. Startup the printer.

Chapter 4 Installing and Replacing the Roll Paper

The printer can install the paper conveniently, which should be 80mm wide. How to deal with the paper will be explained in details in this chapter

4.1 Paper Installation Steps

> ⚠ **Note**
>
> 1. Don't touch the thermal head after printing to avoid being burned.
> 2. Don't pull the paper moving directly with your hand.

1. Push the cover open lever, open the cover.

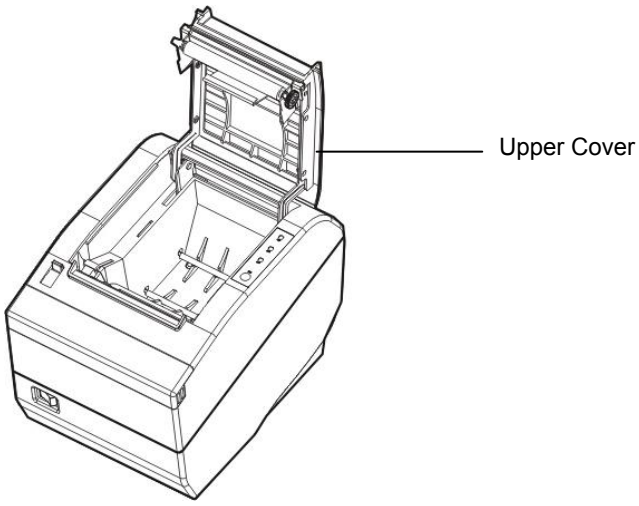


Fig 4-1 Open the cover

2. Insert the paper roll as shown below (Be sure to note the correct direction that the paper comes off the roll).

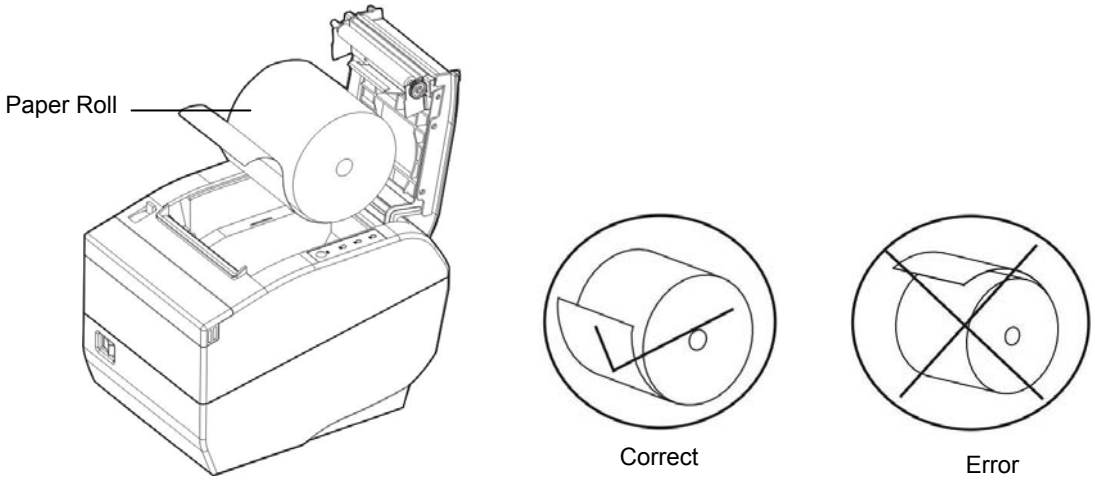


Fig 4-2 Insert the paper roll

Note: Paper head should be pulled out by the direction of paper-input slot, but not the opposite.

3. Pull out a small amount of paper as shown in Fig 4-3.

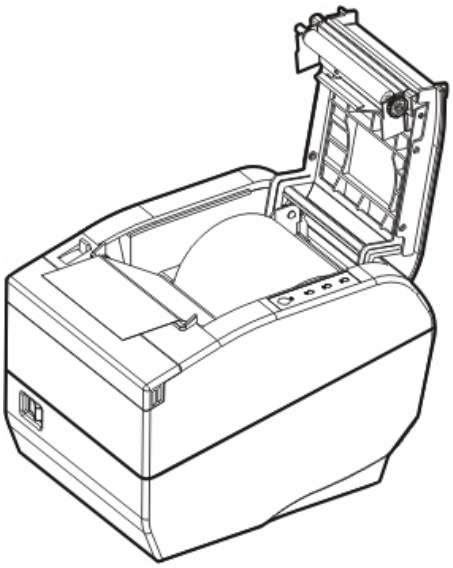


Fig 4-3 Pull out the paper

4. Feed the paper as shown below, and then close the cover.



Fig 4-4 Close the cover

5. If you have connected the cable, turn on the power and then the printer is ready.

NOTE: After finishing installing the paper, if PAPER OUT indicator and ERROR indicator are still on, or the printer rattles when feeding the paper, please open the cover and re-close it tightly.

Chapter 5 Features

5.1 General Specification

Item	Description
Print method	Direct thermal printing
Print direction	Line printing
Paper width	72 mm
Print speed	220mm/s (52line/s)
Print head	Life span: 100 Km
Resolution	8 dot/mm, 576dot/line, 203DPI
Character set	ASCII: 13 international character sets
	Chinese: Big 5 (applied to HK and Taiwan Version)
Code page	9 kinds
Bar code	UPC-A, UPC-E, EAN-13, EAN-8, Code39, Code128, ITF-25, Codabar
Line space	1/6 inch, or programmable in 1/203 inch increments
Paper feed speed	220 mm/s at most
Emulation	ESC/POS
Interface	Parallel interface (Centronics) + Drawer interface (RJ-11) USB interface (2.0 Full-Speed) + Serial interface (RS-232C) + Drawer interface (RJ-11) USB interface (2.0 Full-Speed) + Ethernet interface (10/100Base-T) + Drawer kick-out interface (RJ-11) ***Only equip with one assembled interface when leaving factory. (According to specific interface standards)**
Buffer memory	4MB
Noise	＜38 dB (A)
Control panel	The control panel consists of one key and three LED indicators.
Paper type	Thermal roll paper
Paper specification	Thermal roll paper model: TF50KS－E (Japan paper co.ltd) AF50KS-E (JUJO THERMAL) Width: 79.5 ± 0.5 mm Weight: 53 ～ 80 g/m^2 Maximum diameter: 80 mm *Suggestion: Inner diameter of paper shaft:12mm, Outer diameter of paper shaft:18mm
Physical dimensions	145 mm (Width) × 200 mm (Depth) × 145 mm (Height)
Weight	Approx. 2Kg
Environmental conditions	Operating environment: Temperature: 5 ～ 50℃ Humidity: 10%RH ～ 80%RH (No condensation)
	Storage environment: Temperature: -20 ～ 60℃ Humidity: 10%RH ～ 90%RH (No condensation)
AC Adapter	Input voltage: 100 ～ 240 VAC Frequency: 50Hz/60Hz
	Output voltage: DC24 V Electricity: 2.5 A

Power consumption	① operation: 40 W; ② max: 180 W; ③ standby: 2.9 W Note: Only when the product doesn't connect any power supply, can it consume zero energy.
Reliability	MCBF: 52 million lines
	Life span of cutter: ≥2 million cut (for appointed paper on particularly test condition)
Specified function	Online parameter settings
Paper feed width	79.5 ± 0.5 mm
Max paper thickness	0.065 ～ 0.15 mm
Black mark	Matched

In order to ensure the use life of printer, strictly prohibit printing full line full black exceeding 2 CM.

5.2 Interface Features

The printer can be connected with one drawer and one host. The interface connected to the host can be CENITRONICS parallel interface or Full-speed USB 2.0 interface+RS-232C serial interface or Full-speed USB 2.0 interface+10/100Base-T Ethernet interface according your need.

5.2.1 Parallel Interface

BP-003 printer's parallel interface is compatible with CENIRONICS protocol, supporting BUSY/ACK handshaking protocol.

The connector is a 36-PIN connector, whose pins are indicated as below.

Table A-1: Connector Pin Assignments

Pin number	Signal	Direction	Description
1	/STB	IN	Trigger in low level, read the data in rising edge
2	DATA1	IN	Stand by the parallel data from the first bit to the eight. "1" means high level means, while "0" means low level.
3	DATA2	IN	
4	DATA3	IN	
5	DATA4	IN	
6	DATA5	IN	
7	DATA6	IN	
8	DATA7	IN	
9	DATA8	IN	
10	/ACK	OUT	Acknowledge signal, Low level means that printer is ready for receiving data.
11	BUSY	OUT	High level means printer is too busy to receive data
12	PE	OUT	High level means that paper is out.
13	SEL	OUT	High level with the pull-up resistor.
32	/ERR	OUT	Low level means the printer is in error state
14、15、17、18、34、36	NC	---	NC
16、19～30、33	GND	---	GND, "0" level in logic

Note: ① "IN" means input to the printer, "OUT" means output from printer.

② The signal logical level is TTL level.

Relative signal is shown as Fig 5-1.

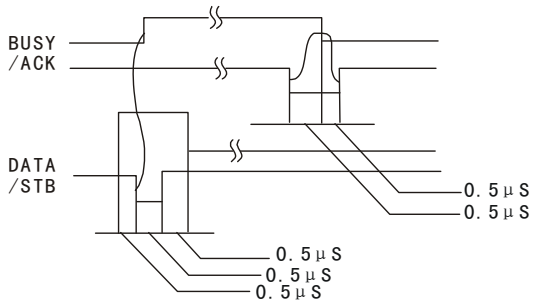


Fig 5-1 Timing signal in parallel

5.2.2 USB Interface

Full-speed USB interface of version 2.0.

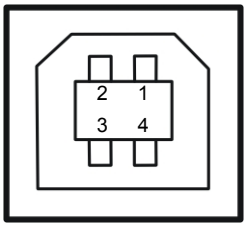


Fig 5-2 USB interface

5.2.3 Serial Interface

BP-003 printer's serial interface is compatible with RS-232C protocol, supporting RTS/CTS and XON/XOFF handshaking protocol. The DB-9 connector and each pin's definitions are shown as below.

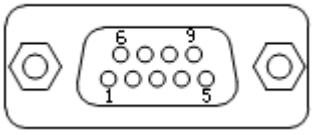


Fig 5-3 Sequence numbers of Serial connector

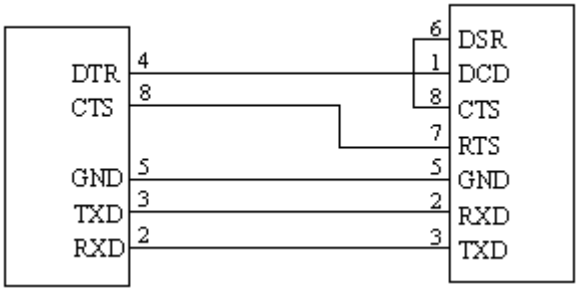
Table A-2 Pin assignments of the serial interface

Pin Number	Signal	From	Description
2	RXD	Host	Receive data from Host
3	TXD	Printer	Sent control code X-ON/X-OFF and data to the Host
8	CTS	Printer	"MARK" state means printer is too busy to receive data; "SPACE" means printer is ready for receiving data.
5	GND	—	Signal GND
4	DTR	Printer	Signal terminal is ready

Note: ① "From" means from the source the signal sending out.

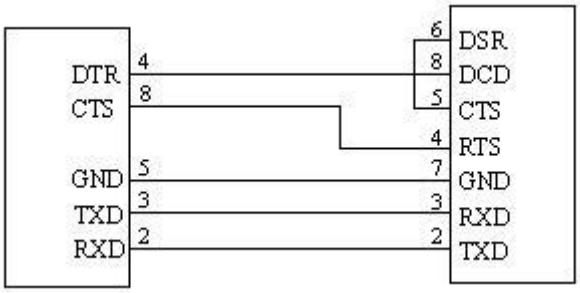
② Signal level is EIA level.

The default setting in serial stands for 9600bps, 8 bits, parity check disabled and 1 stop bit.
BP-003 printer can be connected to the standard RS-232C connector. When connecting with an IBM PC or compatible PC, the connecting picture is shown as figure 5-4. While connecting with a 25 pin PC, you can connect the cable as shown in Fig 5-5.



Printer 9-Pin connector Host 9-Pin connector

Fig 5-4 BP-003 connecting with 9-Pin PC



Printer 9PIN connector Host 25PIN connector

Fig 5-5 BP-003 connecting with 25-Pin PC

5.2.4 Ethernet Interface

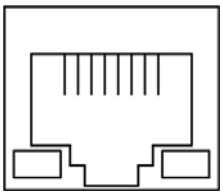


Fig 5-6 Ethernet interface

5.2.5 Cash Drawer Interface

The cash drawer interface on the back of the printer uses the RJ-11 connector, which is shown below.

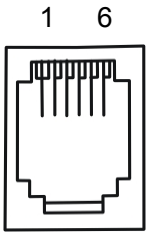


Fig 5-7 Cash drawer connector

Table A-3: Cash drawer connector Pin assignments

Pin number	Signal	Direction
1	Frame GND	---
2	Cash Drawer kick-out drive signal	OUT
3	Cash Drawer Open/closed signal	IN

4	24VDC	OUT
5	Cash Drawer kick-out drive signal	OUT
6	Cash Drawer kick-out Open/closed signal ground≤1A/24V	---
Drive electricity≤1A/24V		

Note: Make sure the cash drawer meets the specification mentioned above, or we will not guarantee to keep the printer in good repair.

5.2.6 Power Supply Interface

The connector is used to connect the printer to the external electrical source. The electrical source is specified as 24V±10% and 2.5A. The interface on the printer is shown in Fig 5-8.

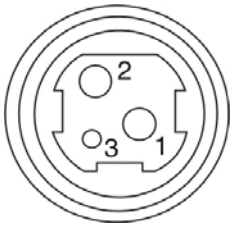


Fig 5-8 Power interface

Chapter6 Troubleshooting and Maintenance

6.1 Maintenance

To prolong the printer's life, make sure that the printer is well away from heaters and other sources of extreme heat, and the surrounding area is clean, dry, and free of dust.

Cleaning paper case and thermal head periodically is the main task of maintaining the printer. We will talk with this problem in this section. It is noted that make sure to turn off the printer before maintenance.

Clean Printer:

Dirt and dust do the most damage to the printer. Clean the paper in the printer and accumulated dirt in the thermal head as well despite the outer case of the printer prevents greater part of dust from invading.

Clean Printer Case:

Remove the dirt in the printer case with clean, soft cloth, and take out the paper pieces with a nipper.

Attention: Be careful not to scratch the printer parts when cleaning.

Clean the printer termly according to the prescription as follows.

Termly cleaning: Once every 6 months or 300 working hours.

Cleaning tool: Dry cloth (Soft cloth if metal parts)

6.2 Error Message on the Control Panel

When the malfunction occurs, the printer will be off-line and give an alarm through indicators. You can make out different malfunctions through the Table A-4 shown below.

Table A-4: Error message on the control panel

Error indicator	PAPER OUT indicator	Malfunction	Solution
Blink fast	OFF	Cutter error	Re-posit the cutter
ON	OFF	Cover is open	Close the cover tightly
OFF	ON	Paper is about to end	Load the paper again
ON	ON	Paper out	Load the paper again
Blink	OFF	Print head overheated	Recover automatically

6.3 Cutter Jammed or Error

If the auto cutter was jammed by paper, you can open the front paper cover and take out paper. If the front paper cover cannot be opened, and the cutter still can not return to the normal position after the printer is restarted, you can pull out the small cover which locates above the auto cutter, and then the cutter will be exposed. Rotate the white plastic gear shown by arrow direction marked on the auto cutter, which can make the cutter return to the normal position which is shown as Fig 6-1.

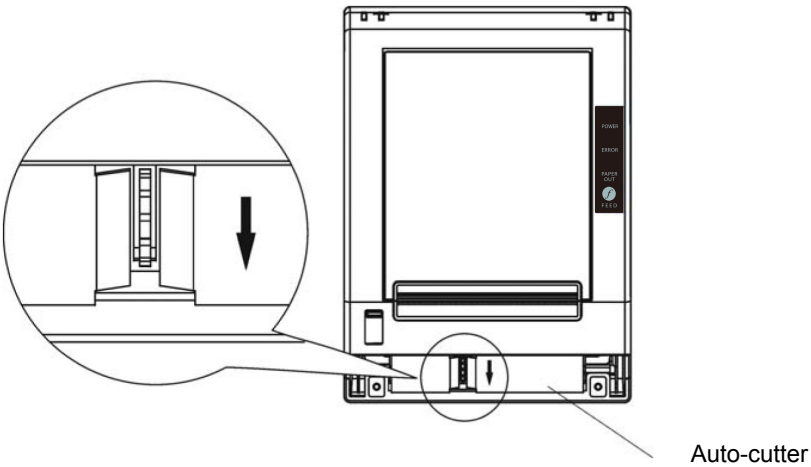


Fig 6-1 Adjust the cutter by hand

Chapter 7 Control Commands

7.1 General

The commands BP-003 supplies are based on ESC/POS, and are compatible with TM-88III series.
The format described as following:

Command		Function
Format:	ASCII:	Indicates the ASCII equivalents
	Decimal:	Indicates the decimal equivalents
	Hex:	Written in hexadecimal code

Description: The function and using instruction of that command.
Example: Some examples are listed for easier understanding.

7.2 Explanation of Terms

BEL		Beeper
Format:	ASCII:	BEL
	Decimal:	7
	Hex:	07

Description:
Active the printer buzzer

HT		Horizontal tab
Format:	ASCII:	HT
	Decimal:	9
	Hex:	O9

Description:
Move the print position to the next horizontal tab position

LF		Print and line feed
Format:	ASCII:	LF
	Decimal:	10
	Hex:	OA

Description:
Print the data in the print buffer and feed one line based on the current line spacing.

FF		Print and Feed to next black mark position
Format:	ASCII:	FF
	Decimal:	12
	Hex:	OC

Description:
Print the data in the print buffer and feeds paper to the print starting position on the next black mark position when black mark takes effect.

DLE EOT n					Real-time status transmission *
Format:	ASCII:	DLE	EOT	n	
	Decimal:	16	4	n	
	Hex:	10	04	n	

Description:
Transmit the selected printer status according to the specified parameter n, 1<=n<=4;

n=1: Transmit print status
n=2: Transmit off-line status
n=3: Transmit error status
n=4: Transmit paper roll sensor status
*Note: Only valid in serial interface.

ESC BEL n1 n2 — Beep for appointment

Format:						
	ASCII:	ESC	BEL	n1	n2	n3
	Decimal:	27	7	n1	n2	n3
	Hex:	1B	07	n1	n2	n3

Description:
N1 specifies the length of beeping time, n2 specifies the length of intermission time and n3 is the beeping times. The unit of n1 and n2 is 100 milliseconds.

ESC SP — Set right-side character spacing

Format:				
	ASCII:	ESC	SP	n
	Decimal:	27	32	n
	Hex:	1B	20	n

Description:
Set the right-side spacing of the character to n*(horizontal or vertical motion unit) n=0～255.
Horizontal or vertical motion unit is specified by GS P command

ESC ! — Set print mode

Format:				
	ASCII:	ESC	!	n
	Decimal:	27	33	n
	Hex:	1B	21	n

Description:
Select the print mode using n as follows. n=0～255

Bit	Value	Function
0	0	Character A
	1	Character B
1, 2	-- -- --	Not define
3	0	Emphasize mode not selected
	1	Emphasize mode selected
4	0	Double-height not selected
	1	Double-height selected
5	0	Double-width not selected
	1	Double-height selected
6	-- -- --	Not define
7	0	Underline mode not selected
	1	Underline mode selected

ESC $ — Set absolute print position

Format:					
	ASCII:	ESC	$	nL	nH
	Decimal:	27	36	nL	nH
	Hex:	1B	24	nL	nH

Description:
Set the distance from the beginning of the line to the position at which subsequent characters are to be

printed.
The distance is (nL+nH*256)* (horizontal or vertical motion unit). Nl, nH=0～255.
Horizontal or vertical motion unit are specified by GS P command.

ESC % Selected/cancel user-define characters set

Format:	ASCII:	ESC	%	n
	Decimal:	27	37	n
	Hex:	1B	25	n

Description:
n=1, Select the user-define characters; n=0, Select inter characters.
Default: n=0

ESC & Define user-define characters

Format:	ASCII:	ESC & y	c1	c2	[x1 d1..d(y*x1)]	[xk d1..d(y*xk)]
	Decimal:	27	38 y	c1	c2	[x1 d1..d(y*x1)]	[xk d1..d(y*xk)]
	Hex:	1B	26 y	c1	c2	[x1 d1..d(y*x1)]	[xk d1..d(y*xk)]

Description:
Define the user-define Characters from c1 to c2.
y=3; 32<=c1<=c2<=126;
0<=x<=12; [Character A 12*24], 0<=x<=9; [Character B 8*16];
d=0~255; k=c2-c1+1;
y specifies the number of bytes in the vertical direction, x specifies the number of dots in the horizontal direction, d specifies the user-define data.

ESC * Select bit-image mode

Format:	ASCII:	ESC *	m	n1	n2	d1..dk
	Decimal:	27	42	m	n1	n2	d1..dk
	Hex:	1B	2A	m	n1	n2	d1..dk

Description:
Select the image mode with m; n1 and n2 specify the number of dots. The image data d1…dk
m=0,1,32,33; n1=0～ 255; n2=0～3; d=0～255.
k=n1+256×n2 (m=0, 1)
k= (n1+256×n2) × 3 (m=32, 33)
The number of dots in horizontal direction is n1+256×n2.
If the number dots exceed the max dot number in a line (shown as below), the excess data is ignored.

m	Mode	Vertical direction		Horizontal direction	
		Number of dots	Dot density	Dot density	Number of dots (max)
0	8-dot single-density	8	68DPI	101DPI	288
1	8-dot double-density	8	68DPI	203DPI	576
32	24-dot single-density	24	203DPI	101DPI	288
33	24-dot double-density	24	203DPI	203DPI	576

ESC - Turn underline mode on/off

Format:	ASCII:	ESC	-	n
	Decimal:	27	45	n
	Hex:	1B	2D	n

Description:
n=0, 48 Turn underline mode off.
n=1, 49 one-dot thick underline mode on

n=2, 50 two-dot thick underline mode on

ESC 2 Set default line spacing

Format:	ASCII:	ESC	2
	Decimal:	27	50
	Hex:	1B	32

Description:
Set the line spacing to 1/6 inch.

ESC 3 Set line spacing as n/203 inch

Format:	ASCII:	ESC	3	n
	Decimal:	27	51	n
	Hex:	1B	33	n

Description:
Set the line spacing to n*(vertical or horizontal motion unit) n=0～255.
The vertical or horizontal motion units are specified by GS P Command.

ESC = Select peripheral device

Format:	ASCII:	ESC	=	n
	Decimal:	27	61	n
	Hex:	1B	3D	n

Description:
The Last bit of n is 0, printer disable.
The Last bit of n is 1, printer enable.

ESC ? Cancel user-define character

Format:	ASCII:	ESC	?	n
	Decimal:	27	63	n
	Hex:	1B	3F	n

Description:
Cancel the character specified by n. n=32~126.

ESC @ Initialize printer

Format:	ASCII:	ESC	@
	Decimal:	27	64
	Hex:	1B	40

Description:
Initialize the printer to the state when the printer was turn on.

ESC D Set horizontal tab position

Format:	ASCII:	ESC D	n1……nk NUL
	Decimal:	27 68	n1……nk NUL
	Hex:	1B 44	n1……nk NUL

Description:
Set the horizontal tab position to the column specified by nk from the beginning of the line.
n = 0~255; k=0~32;

ESC E Turn emphasized mode on/off

Format:	ASCII:	ESC	E	n
	Decimal:	27	69	n
	Hex:	1B	45	n

Description:
When the last bit (LSB) of the n is 0, the emphasized mode is turned off.
When LSB of the n is 1, the emphasized mode is turned on.

ESC J — Print and feed paper

Format:				
	ASCII:	ESC	J	n
	Decimal:	27	74	n
	Hex:	1B	4A	n

Description:

Print the data in print buffer and feed the paper n*(horizontal or vertical motion unit) inches.

n=0～255; Horizontal or vertical motion unit are specified by GS P command.

ESC M — Select character font

Format:				
	ASCII:	ESC	M	n
	Decimal:	27	77	n
	Hex:	1B	4D	n

Description:

n = 0, 48; Character A (12*24) is selected;

n = 1, 49; Character B (8*16) is selected.

ESC R — Select the international character set

Format:				
	ASCII:	ESC	R	n
	Decimal:	27	82	n
	Hex:	1B	52	n

Description:

Select the international character set according the value of n as shown in the follow.

0: USA 1: France 2: Germany 3: U.K 4: Denmark I 5: Sweden 6: Italy 7: Spain I 8: Japan 9: Norway

10: Denmark II 11: Spain II 12: Latin America 13: Korea

ESC V — Turn 90°clockwise rotation mode on/off

Format:				
	ASCII:	ESC	V	n
	Decimal:	27	86	n
	Hex:	1B	56	n

Description:

n=0,48 Turn off 90°clockwise rotation mode.

n=1,49 Turn on 90°clockwise rotation mode.

No 90°clockwise rotation for underline in underline mode.

ESC \ — Set relative print position

Format:					
	ASCII:	ESC	\	nL	nH
	Decimal:	27	92	nL	nH
	Hex:	1B	5C	nL	nH

Description:

Set the print position at (nL+nH*256)* (horizontal or vertical motion unit) inches from current position;

nL, nH=0～255. Horizontal or vertical motion unit is specified by GS P command.

ESC a n — Select justification

Format:				
	ASCII:	ESC	a	n
	Decimal:	27	97	n
	Hex:	1B	61	n

Description:

n=0, 48: Left justification; n=1, 49: centering; n=2, 50; right justification.

ESC c 3 — Select paper end sensor

Format:					
	ASCII:	ESC	c	3	n
	Decimal:	27	99	51	n
	Hex:	1B	63	33	n

Description:

n=xxxxxxx1B, xxxxxx1xB, xxxxxx11B, Paper near end sensor takes effect.

n=xxxxx1xxB, xxxx1xxxB, xxxx11xxB, Paper end sensor takes effect.

ESC c 4 — Select paper sensor to stop printing

Format:	ASCII:	ESC	c	4	n
	Decimal:	27	99	52	n
	Hex:	1B	63	34	n

Description:

n=xxxxxxx1B, xxxxxx1xB, xxxxxx11B; Paper near end, printer stop printing.

n=xxxxx1xxB, xxxx1xxxB, xxxx11xxB; Paper end, printer stops printing.

ESC c 5 — Enable/disable panel button

Format:	ASCII:	ESC	c	5	n
	Decimal:	27	99	53	n
	Hex:	1B	63	35	n

Description:

When the LSB of n is 0, enable button.

When the LSB of n is 1, disable button.

ESC d — Print and feed n lines

Format:	ASCII:	ESC	c	n
	Decimal:	27	100	n
	Hex:	1B	64	n

Description:

Print the data in print buffer and feed n lines, n= 0~255.

ESC j — Print and feed paper conversely

Format:	ASCII:	ESC	j	n
	Decimal:	27	106	n
	Hex:	1B	6A	n

Description:

Print the content in the buffer and feed paper n*vertical unit inch conversely.

n=0～255. Horizontal or vertical motion unit is specified by GS P command.

Note: This function is only for Micro-adjustment. If the distance the paper feeding is over long, which may cause the paper jammed or deviating from print roller.

ESC p m t1 t2 — Generate pulse

Format:	ASCII:	ESC	p	m	t1	t2
	Decimal:	27	112	m	t1	t2
	Hex:	1B	70	m	t1	t2

Description:

Printer output pulse, whose width specified by t1 and t2. On time is t1*2ms, low ist2*2ms.

m=0, 48, 1, 49.

ESC t — Select code page

Format:	ASCII:	ESC	t	n
	Decimal:	27	116	n
	Hex:	1B	74	n

Description:

Select a code page through n as follows:

n=0 PC437; n=1 PC437; n=2 PC850; n=3 PC860; n=4 PC863;

n=5 PC865; n=16 WPC1252; n=17 PC866; n=18 PC852; n=19 PC858;

ESC { Turn on/off upside-down printing mode

Format:	ASCII:	ESC	{	n
	Decimal:	27	123	n
	Hex:	1B	7B	n

Description:

When the LSB of n is 0, upside-down printing mode is turn off.

When the LSB of n is 1, upside-down printing mode is turn on.

FS ! Select Chinese character mode

Format:	ASCII:	FS	!	n
	Decimal:	28	33	n
	Hex:	1C	21	n

Description:

Bit	Off/On	Hex	Decimal	Function
0	-	-	-	Not define
1	-	-	-	Not define
2	Off	00	0	Double-width is not selected
	On	04	4	Double-width is selected
3	Off	00	0	Double-height is not selected
	On	08	8	Double-height is selected
4	-	-	-	Not define
5	-	-	-	Not define
6	-	-	-	Not define
7	Off	00	0	Underline is selected
	On	80	128	Underline is not selected

Select the Chinese character mode according n as follows:

FS & Set Chinese language mode

Format:	ASCII:	FS	&
	Decimal:	28	38
	Hex:	1C	26

Description:

In this mode, the code between 0x81 and 0xff are printed as Chinese character.

FS - Turn Chinese character underline mode on /off

Format:	ASCII:	FS	-	n
	Decimal:	28	45	n
	Hex:	1C	2D	n

Description:

n=0, 48 turn off the Chinese character underline mode.

n=1, 49 turn one dot the thick underline of Chinese character mode on.

n=2, 50 turn two dots the thick underline of Chinese character mode on.

Underline mode is ignored if 90°clockwise rotation is turned on at the same time.

FS . Cancel Chinese language mode

Format:	ASCII:	FS	.
	Decimal:	28	46
	Hex:	1C	2E

Description:

In this mode No Chinese character printed.

FS 2 — Define user-define Chinese characters

Format:						
	ASCII:	FS	2	c1	c2	d1……d72
	Decimal:	28	50	c1	c2	d1……d72
	Hex:	1C	32	c1	c2	d1……d72

Description:
c1=fe; a1<=c2<=fe; 0<=d<=255; c1 specified the first byte of the character code, c2 specified the second byte of the character code. Data dk defined from up to down 3 bytes one column, and from left to right 24 columns.

FS S — Set Chinese character spacing

Format:					
	ASCII:	FS	S	n1	n2
	Decimal:	28	83	n1	n2
	Hex:	1C	53	n1	n2

Description:
0 ≤ *n1* ≤ 255, 0 ≤ *n2* ≤ 255 Set the character left-side spacing to n1*(horizontal or vertical motion unit), right-side spacing to n2*(horizontal or vertical motion unit).
Horizontal or vertical motion unit is specified by GS P command.

FS W — Turn quadruple-size mode on/off for Chinese character

Format:				
	ASCII:	FS	W	n
	Decimal:	28	87	n
	Hex:	1C	57	n

Description:
0 ≤ *n* ≤ 255
When the LSB of n is 0, turn off the quadruple-size mode.
When the LSB of n is 1, turn on the quadruple-size mode.

FS p n m — Print NV bit image

Format:					
	ASCII:	FS	p	n	m
	Decimal:	28	112	n	m
	Hex:	1C	70	n	m

Description:
1 ≤ *n* ≤ 64 m=0, 1, 2, 3, 48, 49, 50, 51
Prints the NV bit image n using the mode specified by m.
m = 0, 48 Normal mode; m = 1, 49 Double width mode;
m = 2, 50 Double height mode; m = 3, 51 Quadruple mode.

FS q n — Define the NV bit image

Format:					
	ASCII:	FS	q	n	[xL xH yL yH d1 d2 …dk]1…[xL xH yL yH d1 d2 …dk]
	Decimal:	28	113	n	[xL xH yL yH d1 d2 …dk]1…[xL xH yL yH d1 d2 …dk]
	Hex:	1C	71	n	[xL xH yL yH d1 d2 …dk]1…[xL xH yL yH d1 d2 …dk]

Description:
1 ≤ *n* ≤ 64; xH= 0; 0<=xL<=72; yH=0; 0<=yL<=30
k= (xL+xH*256)*(yL+yH*256)*8

The command can define 64 bit images at the same time. All NV images preciously defined are canceled when new bit image defined. When this command processing, ERROR indicator will be on for a period time, then the PAPER OUT indicator and ERROR indicator will be both on and the printer resets. No more other data or commands followed this command, or may cause data lost or printing mess. The NV image data will be stored in the printer even which is powered off, and will not lose till this command reprocessed. Excessive use of this function may cause the NV memory damaged. As a guideline, the command should not be processed more than 10 times per day.

The hole command including the bit image data should less than 128K bytes (1M bits).
xL,xL specifies (xL+xH*256) bytes in the horizontal direction for the NV bit image you defined.
yL,yH specifies (yL+yH*256) bytes in the vertical direction for the NV bit image you defined.
d specifies the definition data for the NV bit image(column format).

GS BEL n1 n2 — Beep for appointment

Format:						
	ASCII:	GS	BEL	n1	n2	n3
	Decimal:	29	7	n1	n2	n3
	Hex:	1D:	07	n1	n2	n3

Description:

N1 specifies the beeping times, n2 specifies the length of beeping time and n3 specifies the length of intermission time. The unit of n1, n2 is 0.1 second.

GS FF — Print and feed to next black mark position

Format:			
	ASCII:	GS	FF
	Decimal:	29	12
	Hex:	1D	OC

Description:

Print the content in the buffer and feed paper to the next black mark position.

GS ! — Select Character size

Format:				
	ASCII:	GS	!	n
	Decimal:	29	33	n
	Hex:	1D	21	n

Description:

n=0~7, 16~23, 32~39, 48~55, 64~71, 80~87, 96~103,112~119;

Selects the character height (vertical number of times normal font size) using bits0 to bits3 and selects the character width (horizontal number of times normal size) using bits4 to bits7.

GS (F pL pH a m nL nH — Set adjustment

Format:										
	ASCII:	GS	(	F	pL	pH	a	m	nL	nH
	Decimal:	29	40	70	pL	pH	a	m	nL	nH
	Hex:	1D	28	46	pL	pH	a	m	nL	nH

Description:

（pL+（pH×256））=4（Here pL=4, pH=0）; 1≤a≤2; m=0, 48 or 1, 49

0≤（nL+nH×256）≤65535,（Here 0≤nL≤255,0≤nH≤255）

This command is only effective when allowing black mark sensor.

Set the printer adjustment value specified by a.

- The numbers of parameter (such as a) specified by pL and pH are (pL+ (pH*256)) bytes.
- A specifies the value of original position and paper cut position.

a	Function
1	Set the value of original position
2	Set the value of paper cut position

- M specifies the direction of adjustment.

m	Function
0, 48	Specify the direction of feeding paper forward.
1, 49	Specify the direction of feeding paper conversely

- The setting value of nL and nH is specified as (nL+nH*256)*0.125 millimeter.

GS * — Define downloaded bit image

Format:						
	ASCII:	GS	*	n1	n2	d1…dk
	Decimal:	29	42	n1	n2	d1…dk
	Hex:	1D	2A	n1	n2	d1…dk

Description:

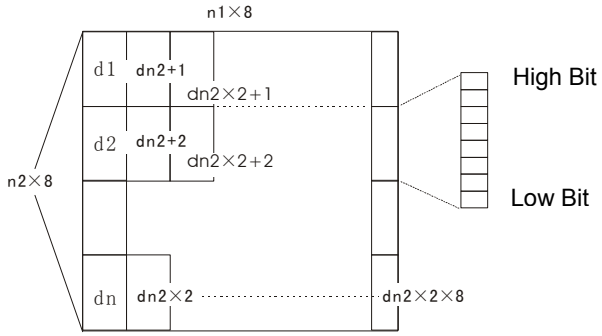
Define the downloaded bit image in the downloaded graphic area.

n1=1～48. n2=1～255. n1×n2<1200, k=n1×n2×8.

d specifies the bit image data. n1×8 dots in the horizontal direction and n2×8 dots in the vertical direction.

The downloaded bit image is available till printer is powered off or reset.

The format of bit image is shown below.



GS /　　Print downloaded bit image

Format:
ASCII:	GS	/	n
Decimal:	29	47	n
\Hex:	1D	2F	n

Description:
Print the downloaded bit image using the mode specified by n. n=0, 1, 2, 3, 48, 49, 50, 51.
The bit image defined by GS * command. n specifies the mode as follows:

n	Mode	Density in vertical	Density in horizontal
0, 48	Normal	203DPI	203DPI
1, 49	Double-width	203DPI	101DPI
2, 50	Double-height	101DPI	203DPI
3, 51	Quadruple	101DPI	101DPI

GS B　　Turn white/black reverse mode on/off

Format:
ASCII:	GS	B	n
Decimal:	29	66	n
Hex:	1D	42	n

Description:
When the LSB of n is 0, turn the white/black reverse mode off.
When the LSB of n is 1, turn the white/black reverse mode on.

GS H　　Select print position of HRI character

Format:
ASCII:	GS	H	n
Decimal:	29	72	n
Hex:	1D	48	n

Description:
Select the print position of Human Readable Interpretation (HRI) when printing a bar code, using n as follows: n=0, 48: NO HRI printing. n=1, 49: above the barcode. n=2, 50: below the barcode. n=3, 51: Both above and below.

GS L　　Set left margin

Format:
ASCII:	GS	L	nL	nH
Decimal:	29	76	nL	nH
Hex:	1D	4C	nL	nH

Description:
Set the left margin to (nL+nH*256)*(horizontal or vertical motion unit); nL, nH=0～255.
Horizontal or vertical motion unit is specified by GS P command.

GS P　　Set horizontal or vertical motion unit

Format:
ASCII:	GS	P	x	y
Decimal:	29	80	x	y
Hex:	1D	50	x	y

Description:

Set the horizontal and vertical unit to 1/x inch and 1/y inch.
When x or y=0, the default horizontal or vertical unit is selected.

GS V — Select cut mode and cut paper

Format:					
	ASCII:	GS	V	m	(n)
	Decimal:	29	86	m	(n)
	Hex:	1D	56	m	(n)

Description:
(There is only one cut mode can be selected if the cutter can only realize one cut type.)
m=0, 48; No n parameter, Executes a full cut.
m=1, 49; No n parameter, Executes a partial cut (with one point left in the middle).
m=6, n=0~255; Feed paper to n*(horizontal or vertical motion unit) and executes a full cut.
m=66, n=0~255; Feed paper to n*(horizontal or vertical motion unit) and executes a partial cut.

GS W — Set print area width

Format:					
	ASCII:	GS	W	nL	nH
	Decimal:	29	87	nL	nH
	Hex:	1D	57	nL	nH

Description:
Set the print area width to (nL+nH*256)* (horizontal or vertical motion unit), nL, nH=0～255.
Horizontal or vertical motion units are specified by GS P.

GS f — Select the HRI character font

Format:				
	ASCII:	GS	h	n
	Decimal:	29	102	n
	Hex:	1D	66	n

Description:
Select the HRI character when printing a bar code, using n as follows:
n=0, 48; Selects character A (12*24)
n=1, 49; Selects character B (8*16)

GS h — Set bar code height

Format:					
	ASCII:	GS	h	n	
	Decimal:	29	104	n	
	Hex:	1D	68	n	

Description:
Set the height of the bar code to n dots.
n=0～255.

GS k — Print bar code

Format:						
	ASCII:	GS	k	m	d1..dk	NUL
	Decimal:	29	107	m	d1..dk	0
	Hex:	1D	6B	m	d1..dk	00
*	ASCII:	GS	k	m	n d1..dn	
	Decimal:	29	107	m	n d1..dn	
	Hex:	1D	6B	m	n d1..dn	

*when m>64

m	Bar code type	Amount of data	The range of k	character	Character code
0	UPC-A	Fixed	11<=k<=12	0~9	48<=d<=57
1	UPC-E	Fixed	11<=k<=12	0~9	48<=d<=57
2	EAN13	Fixed	12<=k<=13	0~9	48<=d<=57
3	EAN8	Fixed	7<=k<=8	0~9	48<=d<=57

4	CODE39	Can be changed	1<=k	0~9,A~Z,SP, $,%,+,-,.,/ *(stat, stop)	48<=d<=57,48<=d<=57, d=32,36,37,43,45,46, 47. d=42 (stat, stop)
*65	UPC-A	Fixed	11<=n<=12	0~9	48<=d<=57
*66	UPC-E	Fixed	11<=n<=12	0~9	48<=d<=57
*67	EAN13	Fixed	12<=n<=13	0~9	48<=d<=57
*68	EAN8	Fixed	7<=n<=8	0~9	48<=d<=57
*69	CODE39	Can be changed	1<=n<255	0~9,A~Z,SP, $,%,+,-,.,/ *(star, stop)	48<=d<=57,48<=d<=57, d=32,36,37,43,45,46, 47. d=42 (stat character)
*70	ITF	Can be changed	1<=n<255 (Even)	0~9	48<=d<=57
*71	CODABAR	Can be changed	1<=n<255	0～9,A～ D,$,+,-,.,/,:	48≤d≤57,65≤d≤68, 36,43,45,46,47,58
*73	CODE128	Can be changed	2<=n<255	NUL~SP(7FH)	0<=d<=127

GS v 0 — Print raster bit image

Format:						
	ASCII:	GS	v	0	m	xL xH yL yH d1…dk
	Decimal:	29	118	48	m	xL xH yL yH d1…dk
	Hex:	1D	76	30	m	xL xH yL yH d1…dk

Description:

Print a raster bit image using the mode specified by m as follows.

m=0, 48: normal; m=1, 49: double width; m=2, 50: double height; m=3, 51: quadruple.

XL, xH, yL, yH=0~255;

XL, xH specifies (xL+xH*256) bytes in horizontal direction for the bit image;

YL, yH specifies (yL+yH*256) dots in vertical direction for the image.

k= (xL+xH*256)*(yL+yH*256) indicates the number of bit image data.

GS w — Set barcode width

Format:				
	ASCII:	GS	w	n
	Decimal:	29	119	n
	Hex:	1D	77	n

Description:

Set the horizontal size of barcode.

2<=n<=6.

Appendix Commands List

Here lists the commands supported in the printer in alphabetical order.

Control commands	Functions
BEL	Beeper
HT	Horizontal tab
LF	Print and line feed
FF	Print and Feed paper to next black mark position
DLE EOT	Real-time status transmission
ESC BEL	Beep for appointment
ESC SP	Set right-side character spacing
ESC !	Set print mode
ESC $	Set absolute print position
ESC %	Select/cancel user-defined character set
ESC &	Define user-define characters
ESC *	Select bit-image mode
ESC –	Turn underline mode on/off
ESC 2	Select default line spacing
ESC 3	Set line spacing
ESC =	Select peripheral device
ESC ?	Cancel user-define character
ESC @	Initialize printer
ESC D	Set horizontal tab position
ESC E	Turn emphasized mode on/off
ESC J	Print and feed paper
ESC M	Select character font
ESC R	Select the international character set
ESC V	Turn 90°clockwise rotation mode on/off
ESC \	Set relative print position
ESC a	Select justification
ESC c 3	Select paper end sensor
ESC c 4	Select paper sensor to stop printing
ESC c 5	Enable/disable panel button
ESC d	Print and feed n lines
ESC j	Print and feed paper conversely
ESC p	Generate pulse
ESC t	Select code page
ESC {	Turn on/off upside-down printing mode
FS !	Select Chinese character mode
FS &	Set Chinese language mode
FS -	Turn Chinese character underline on /off
FS .	Cancel Chinese language mode
FS 2	Define user-define Chinese characters
FS S	Set Chinese character spacing
FS W	Turn quadruple-size mode on/off for Chinese character
FS p n m	Print NV bit image
FS q n	Define the NV bit image
GS BEL	Beep for appointment
GS FF	Print and Feed paper to next black mark position
GS !	Select Character size
GS *	Define downloaded bit image
GS /	Print downloaded bit image
GS B	Turn white/black reverse mode on/off
GS H	Select print position of HRI character
GS L	Set left margin
GS P	Set horizontal or vertical motion unit

GS V	Select cut mode and cut paper
GS W	Set print area width
GS f	Select the HRI character font
GS h	Set bar code height
GS k	Print bar code
GS v 0	Print raster bit image
GS w	Set bar code width