

SNBC

USER'S MANUAL

KIOSK Series Printers (BK-L216)

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Declaration

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Warning

Items shall be strictly followed to avoid injury or damage to body and equipment.



Caution

Items with important information and prompts for operating the printer.



Heating

The print head is a thermal element and it is at high temperature during printing or just after operation, therefore please do not touch it and its peripherals for safety reasons.



Warning

The thermal head is an ESD-sensitive device. To prevent damage caused from static electricity, do not touch either its printing part or connecting parts.

- The quality control system of New Beiyang has been approved by the following certification.



DNV ISO9001: 2000

Safety Instructions

Before installing and using the printer, please read the following items carefully.

- Install the printer in a flat and stable place.
- Reserve adequate space around the printer so that the operation and maintenance can be performed conveniently.
- Keep the printer far away from water source.
- Do not use or store the printer in a place exposed to heat of fire, moisture and serious pollution and do not expose the printer to direct sunlight, strong light and heater.
- Do not place the printer in a place exposed to vibration and impact.
- No dew condensation is allowed to the printer. In case of such condensation, do not turn on the power until it has completely gone away.
- Connect the DC adapter to an appropriate grounding outlet. Avoid sharing one electrical outlet with large power motors and other devices that may cause the fluctuation of voltage.
- Disconnect the DC adapter when the printer is deemed to idle for a long time.
- Don't spill water or other electric materials into the printer. In case this happens, turn off the power immediately.
- Do not allow the printer to start printing when there is no recording paper installed, otherwise the print head and platen roller will be damaged.
- To ensure quality print and normal lifetime, use recommended paper or its equivalent.
- Shut down the printer when connecting or disconnecting interfaces connectors to avoid damages to control board.
- Set the print darkness to a lower grade as long as the print quality is acceptable. This will help to keep the print head durable.
- Do not disassemble the printer without permission of a technician, even for repairing purpose.
- Keep this manual carefully in hand for usage and reference.

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1. General description

1.1 Introduction

BK-L216 is a high performance thermal printer with cutter and presenter as optional and can accept up to 203mm (Outer diameter) paper rolls. The maximum print width is 216mm. It can be widely used in Kiosk applications like data communication terminal, test instrument terminal and information consulting terminal etc.

BK-L216 consists of the following modules.

- Thermal printing unit
- Presenter (optional or with paper out path structure)
- Paper holder (optional)
- Control board
- Cutter

According to different paper roll installation method, BK-L216 has models in horizontal and vertical structures for customers to select. BK-L216 can be connected with other devices by serial interface and parallel interface, or serial interface and USB interface. Drivers are available for Win95/98/NT4.0/2000/XP/LINUX. BK-L216 has the following features:

- Easy operation & maintenance
- Semi-automatic paper loading
- Automatic cutting controllable
- Paper rolls up to Ø203mm
- Multiple sensors for various status detection
- Real-time commands and ASB function

1.2 Denomination

BK-L 216 - X X X X X
 a b c d e f

- | | |
|---|--|
| <p>a Standard name</p> <p>b Resolution
 2: 203 DPI
 3: 300 DPI</p> <p>c Interface type
 D: RS-232 and Centronics
 U: RS-232 and USB
 R: RS-232</p> | <p>d Cutter
 K: with cutter
 Default: Without cutter</p> <p>e Presenter
 P: with presenter
 Default: Without presenter</p> <p>f Frame type
 H: Horizontal structure
 V: Vertical structure
 Default: without paper holder</p> |
|---|--|

Denomination sample: BK-L2163UKPH means a BK-L216 printer of 300 DPI, with RS-232 & USB interfaces, cutter, presenter and horizontal paper holder.

2. Specifications

2.1 Technical Specifications

Items		Parameter		
		203dpi Model	300dpi Model	
	Print method	Direct thermal line		
	Resolution	203dpi	300dpi	
	Paper Length	210mm-216mm		
	Print Width	Max.216mm (8.5 ")		
		Max.1728 点		
	Print height	Standard mode	Max: 2 x A4 Min: A4/3(99mm)	Max: 2 x A4 Min: A4/3(99mm)
		Special mode	Max: 1000mm Min: A4/3(99mm)	Max: 1000mm Min: A4/3(99mm)
	Print speed	100mm/s		
	RAM memory	SRAM: 1MB		
	Flash memory	1MB/2MB/4MB		
	Print head temperature detecting	Thermal resistor		
	Print head position detecting	Micro switch		
	Paper / mark detecting	Photoelectrical Sensor		
	Paper near end detecting	Photoelectrical Sensor		
Interface	RS-232, Centronics (optional), USB (optional)			
Barcodes	Barcode	CODE128, ITF , UPC-A, UPC-E, EAN13 EAN8 , CODE39, CODE93, CODABAR		
Fonts	Fonts	Standard ASCII, Compressed ASCII Big Font (optional) (Simplified Chinese, traditional Chinese, Japanese, Korean)		
	Fonts Process	All fonts can be enlarged 1 to 6 times vertically and horizontally respectively ;Rotation Print (0 ⁰ , 90 ⁰ , 180 ⁰ , 270 ⁰) Bold, white/black reverse, Underline.		
Graphics	Graphics	Support BMP bit Image download to RAM or FLASH Support direct BMP Print		
Medium	Paper type	Continuous paper / marked paper / folded Paper		
	Paper roll OD	Max.203mm		
	Paper roll ID	Standard: 50mm, Optional: 25.4mm or ≥50mm		
	Thickness	60~100 um		
	Thermal surface	Outer side		
Power	Operation voltage	24V DC, 3.1A(average) Note: printing duty is 12.5%		
PRESENTER	Paper out speed	≥400mm/s		
	Paper retracting speed	≥400mm/s		

Items	Parameter	
	203dpi Model	300dpi Model
Function modes	Retraction/Ejection/Hold and wait/close/high speed presenting(optional) Note: ejecting paper or presenting paper at high speed is customized function	
Reliability	Print head lifetime	≥50Km
	Cutter lifetime	≥500,000
	MTBF	360,000 hours
Environment	Operation Environment	+5~45°C, 10-90%RH (Non-condensed)
	Storage Environment	-5~45°C, 10 - 95% RH (Non-condensed)
Physics Character	Dimensions	297(W)×211(D)×88(H)mm (Without paper holder)
	Weight	About 6Kg (without paper roll)

Table 2.1 Technical specification

Note:

- The print speed will decrease to 50mm/s when you use the model of 300dpi with high thickness.
- Customized mode is specially designed for printing over-long page. In this mode, the PRESENTER presents the printout during printing and cuts the printout when printing finishes. Printout Retraction and Hold & Wait functions are optional.
- The PRESENTER is a mechanism accommodating paper, and lies at the front of the printer.

2.2 Paper Specifications

- Paper type: Continuous paper /marked paper
- Paper supply Method : Paper roll/ Folded paper
- Paper width : 210mm –216mm
- Paper thickness : 60μm-100μm
- Thermal layer : Outer side of the roll
- Paper roll specification
 - : 50mm (inner dimension of standard core)
 - : 25.4mm or ≥50mm (inner dimension of optional core)
 - :203mm (maximum paper outer dimension)
- Recommended paper:

➤ Continuous paper specification

Paper type	Manufacturer
TF50KS – E2C	Nippon Paper Industries Co., Ltd
F240AC/F220-VP	Mitsubishi Paper Mill Co., Ltd
KF060-FEAH	New OJI Paper Co., Ltd.
F70NA	FUJI PHOTO FILM CO., LTD
FV230A1	mitsubishi paper mill co., ltd.

Table 2.2 Printer recommended paper

➤ Marked paper specification

In marked paper mode, the printer determines cut position by referencing black mark position. Detailed paper should meet

the following requirement besides that of standard paper:

Mark length L1: $20\text{mm} \leq L1$

Mark height L2: $4\text{mm} \leq L2 \leq 8\text{mm}$

Space between two near Marks L3: $99\text{mm} \leq L3 \leq 305\text{mm}$

Mark position on paper: Right, middle or left side on non-thermal sensitive surface of paper.

Reflectivity: The reflectivity of black mark shall be less than 15% while the paper itself reflectivity shall exceeds 85%. There shall be no any patterns or add items on the area between black marks, such as advertisement, figure and so on.

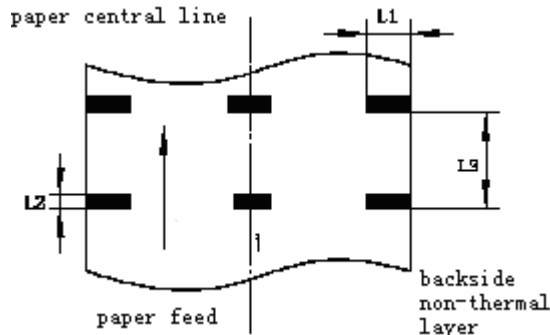


Figure 2.1 Mark position sketch map

Notes:

- Mark height can be set by adjusting printer configuration.
- The paper path has three positions selectable for black mark sensor installation. Only one sensor is mounted on the right side of the paper path (default) when the printer is delivered (Paper feeding direction).
- When the printer is in motionless status, it does not detect any black marks. Therefore, if the paper is pulled away from it compulsorily, the printer gives no alarm of paper end. This feature design assures that the printer does not alarm paper end errors when a black mark stops on paper near end sensor of the printer.

➤ **Folded paper specification**

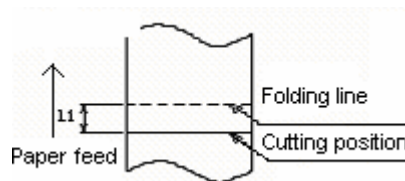


Figure 2.2 Relations between folding line position and cutting position

- When using folded paper, make sure to keep the folding line outside of the printing area to avoid paper jammed.
- It is recommended to set the cutting position 0.5 to 2mm below the folding line (reverse to feeding paper direction) to prevent paper jam.
- Refer to continuous and marked paper specification to decide the position relation between folding line and black mark.



Notice:

- Please use the recommended paper or its equivalents. Using other types of paper may affect print quality and reduce the print head lifetime.
- Do not paste the paper to the shaft core.
- If the paper comes in contact with chemical or oil, it may discolour or be less heat sensitive, which will greatly affect the print quality.
- Do not rub the paper surface with a nail or hard metal. Otherwise it may discolour.

- When the temperature goes up to 70 degrees, paper will discolour. So please be careful to the effect of temperature, humidity and sunlight in environment.

3. Structure and functions

3.1 Appearance

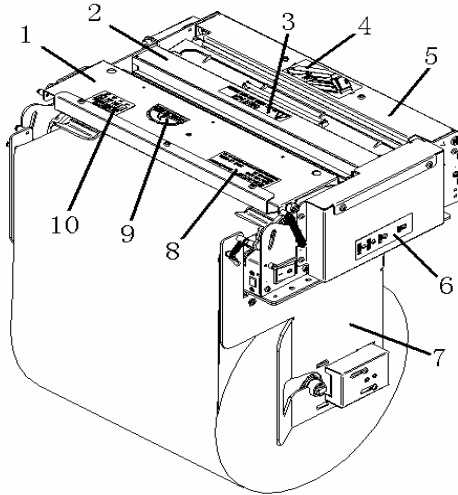


Figure 3.1 Vertical structure

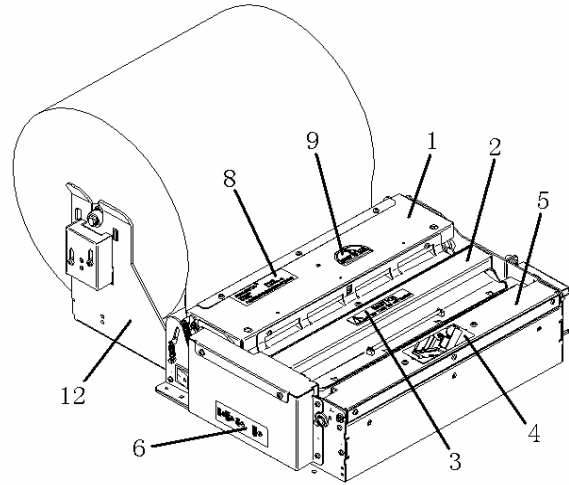


Figure 3.2 Horizontal structure

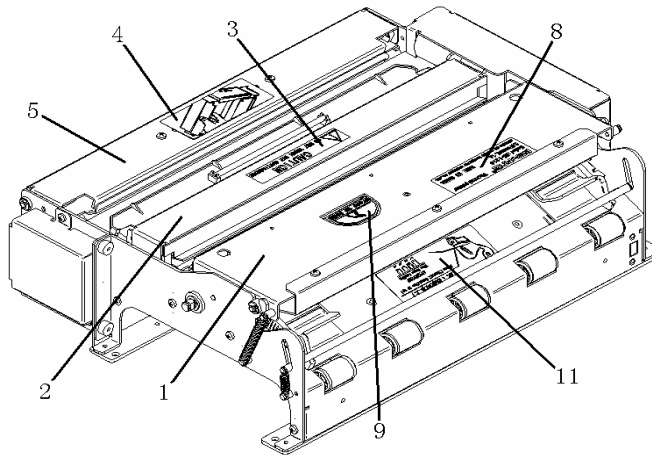


Figure 3.3 Structure without paper holder

- 1-----Print unit
- 2-----Cutter
- 3-----Cutter label
- 4-----Presenter upper cover open label
- 5-----Presenter
- 6-----Button pad
- 7-----Paper holder (for vertical structure only)
- 8-----Product Label
- 9-----Print head cover open label
- 10----- Paper feed label (for vertical structure only)

- 11-----Paper feed label (for horizontal structure and without paper holder type)
- 12-----Paper holder (for horizontal structure only)

3.2 External Dimension (without paper roll)

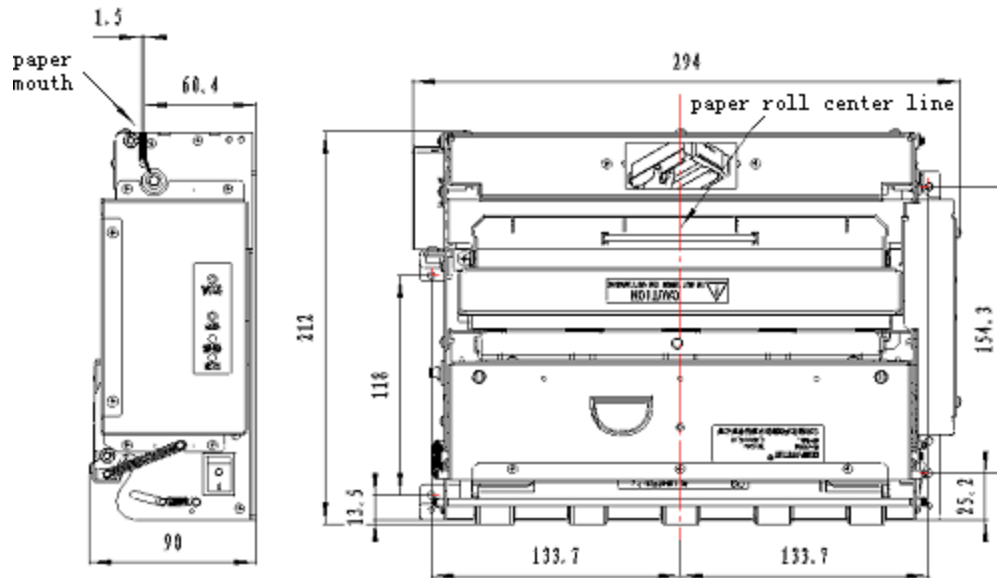


Figure3.4 Dimension without paper holder (294*210*90mm)

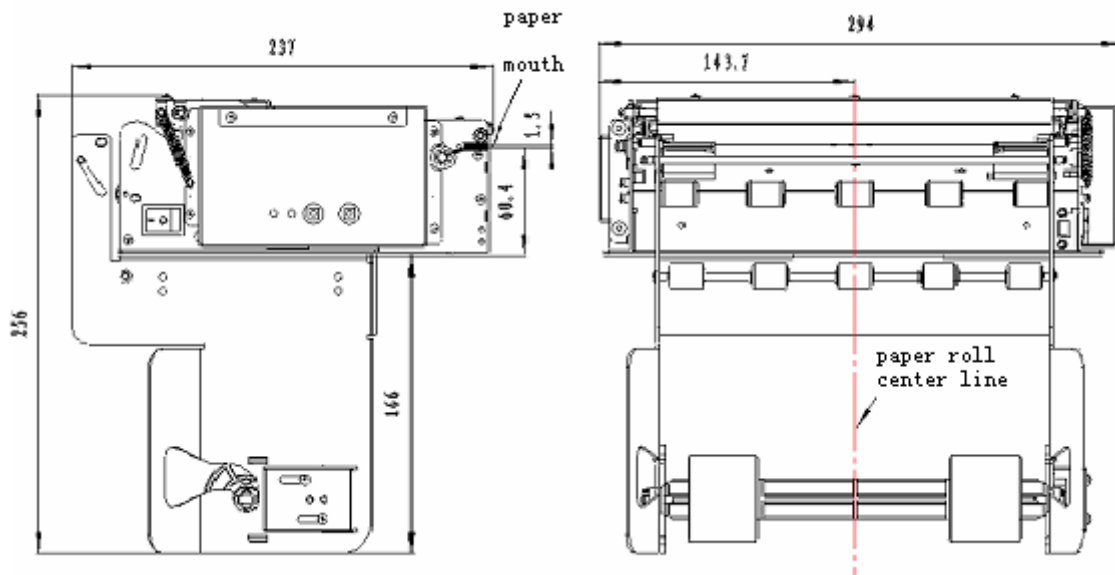


Figure 3.5 Dimension of vertical structure (294*236*256mm)

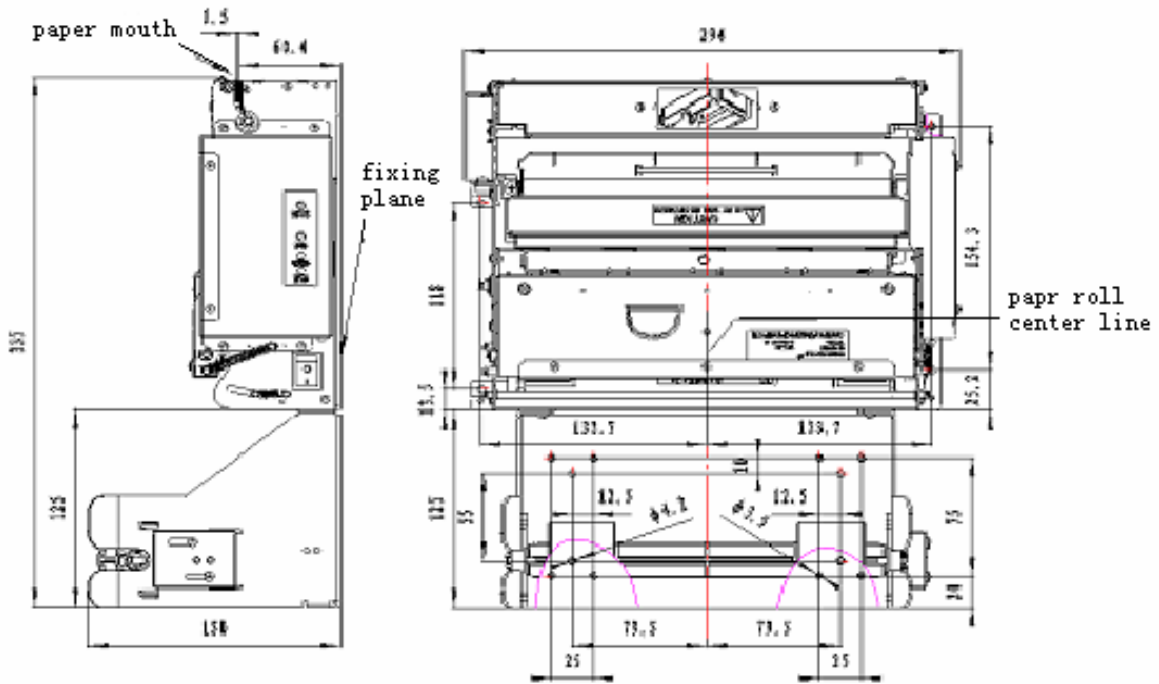


Figure 3.6 Dimension of horizontal structure (294*335*150mm)

3.3 Printer mechanism

3.3.1 Printer mechanism module appearance (without paper holder)

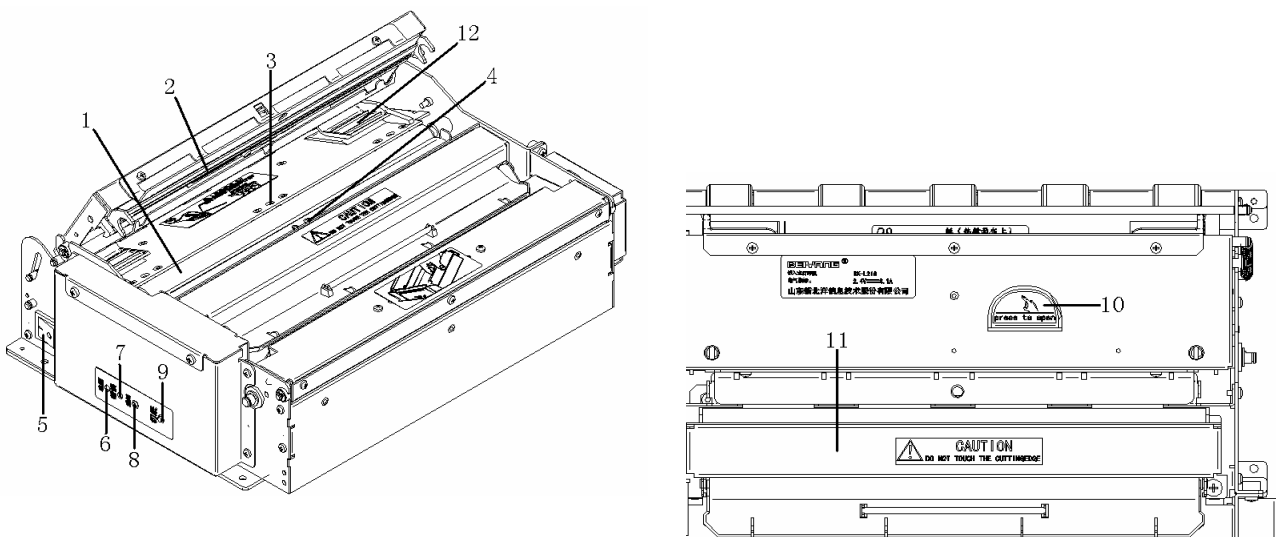


Figure 3.7 Print mechanism module position

- 1-Print platen roller
- 2-Print head
- 3-Paper sensor
- 4-Paper loading sensor
- 5-Power switch
- 6-Power LED (Green)
- 7-Error LED (Red)
- 8- FEED button
- 9-CUT button
- 10-Printer upper cover opening button
- 11-Cutter
- 12-Paper guide module

3.3.2 Printer mechanism module explanation

1. **Paper sensor** --Detect whether there is paper.
2. **Paper loading sensor** --Detect the position of the front end of paper.
3. **CUT button** --Press to cut paper under any circumstances (even the printer has errors)
4. **FEED button** --Under normal status (no error), press to feed paper. Keep pressing for continuous paper feeding. Turn on the power while pressing this button for one second to print self test page. Content in self test page changes with the configuration of the printer.
Note: make sure that there is paper in the printer and the print head is not uplifted before starting self test page.
(For self test page , please refer to [Appendix 1 printer self test page](#))
5. **Error LED (Red)** --This LED is used to indicate different status of the printer. Normally, it isn't light. When errors happen (for example, paper end), it will flash to give alarms.
6. **Power LED (Green)** --To indicate whether the power is on and it lights all the time when the power is turned on
7. **Power switch** --press "O" to turn off the power and press "—" to turn on the power.
8. **Paper guide module** --adjust left or right paper guide module for adapting different paper width from 210mm to 216mm.



Heating:

Print head: The print head are calorific in use, so please don't touch it just after operation

3.4 Presenter module

3.4.1 Appearance

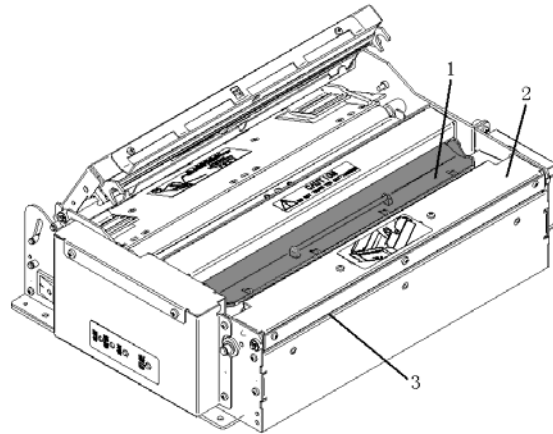


Figure3.8 Presenter appearance

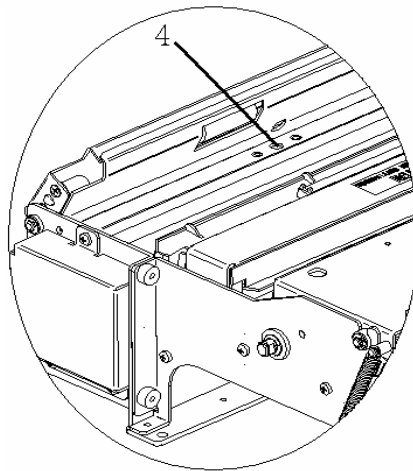


Figure3.9 Presenter sensor position

- 1.--- Presenter turning board
- 2.--- Presenter module
- 3.--- Paper path in presenter
- 4.--- Paper out sensor

3.4.2 Presenter parts explanation

paper out sensor: to detect paper status



Caution

Do not place the presenter module in a place exposed to direct sunshine. Otherwise paper out sensor will become ineffective.

3.5 Paper holder

3.5.1 Paper holder appearance

- 1-Paper roll shaft
- 2-Paper roll support
- 3-Paper near end sensor
- 4-Paper near end sensor inter-connective socket
- 5-Paper roll position fixing piece (each one on the left and right)

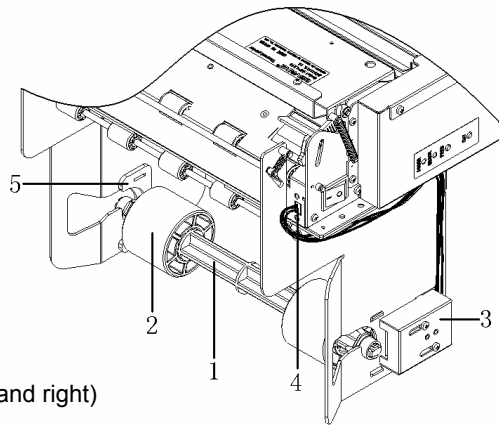


Figure 3.10 Vertical paper holder appearance

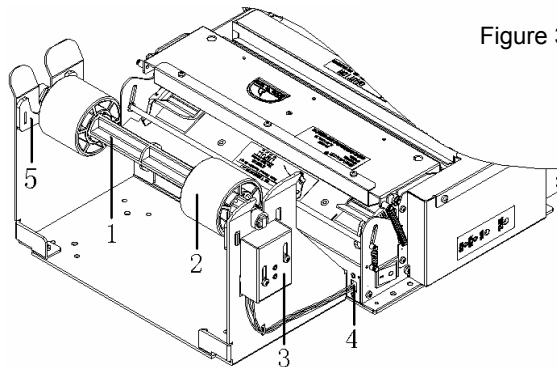


Figure 3.11 Horizontal paper holder appearance

3.5.2 Paper holder module explanation

1) Paper near end sensor

- ① User may check paper status by sending inquiring command (refer to “command set” for details) to the printer.
- ② Users can adjust the position of paper near end sensor to control the amount of remaining paper according to different paper roll diameter (see figure 3.10 and 3.11). To adjust the sensor, please loose those two fixing screws and move the positioning board up or down to the right position along the slide track then tighten the screws.

2) Paper roll shaft

Paper roll support (2) is needed when a paper roll with a 50 mm ID is used. For paper roll with 25mm ID, use only the paper roll shaft (1).

3) Paper roll position fixing piece (5)

Fix paper roll position fixing piece on paper holder only when using a 210mm wide paper roll. For 216mm wide paper, please remove the paper roll position fixing piece.



Caution

When you fix or remove paper roll position fixing piece, you should adjust both left and right paper guide modules (refer to 12 in [3.3.1 printer mechanism module appearance](#)) at the same time to match with different paper width.

3.6 Interface

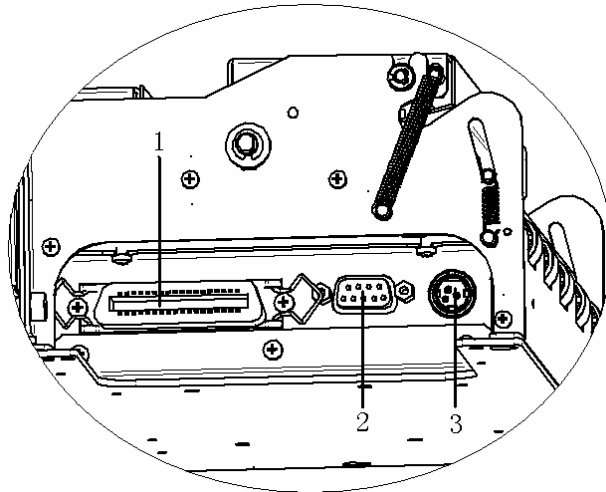


Figure 3.12 Parallel interface mode

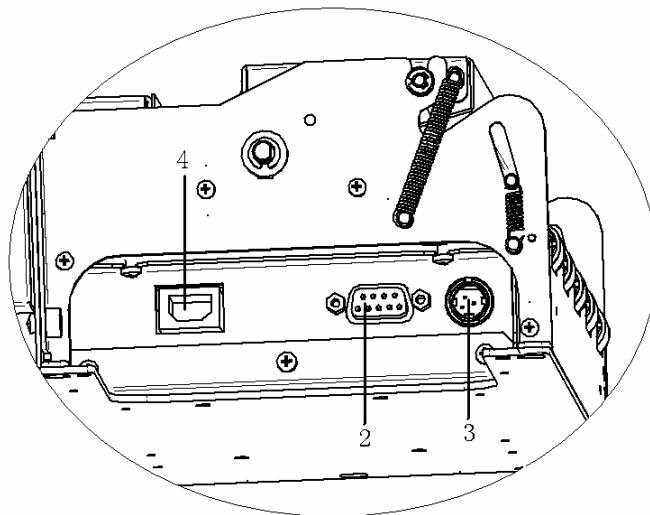


Figure3.13 USB interface mode

- 1.--- Centronics (parallel interface)
- 2.--- RS-232
- 3.--- Power socket
- 4.--- USB interface



Notice:

Only one kind of interface between parallel and USB can be configured in one printer.

4. Installation and suggestion

4.1 Unpacking

Open the carton and all packing materials, and check whether all items listed on the packing list are in and if they have any damages. In case of damages or missing items, please contact your dealer or the manufacture for assistance.

4.2 Assembling the printer (for vertical and horizontal type)

For safety purpose, print mechanism and paper holder should be packed separately in transport. Before getting the printer into use, please reassemble them according to the following figures.

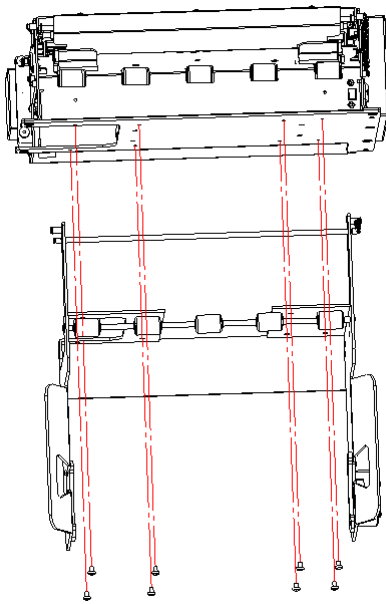


Figure 4.1 Vertical type

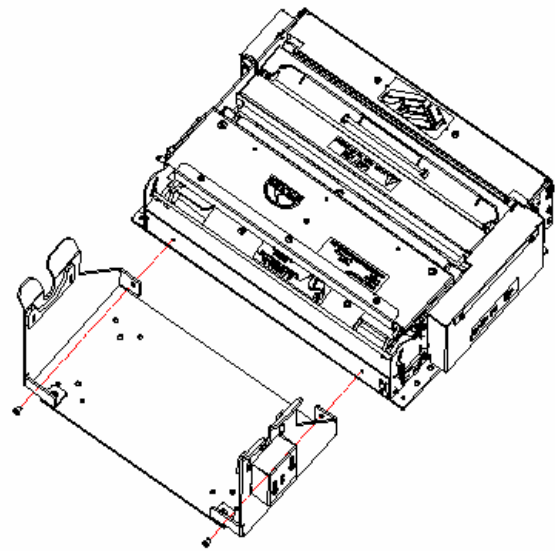


Figure 4.2 Horizontal type



Notice:

Make sure to plug paper near end sensor pin into its inter-connective socket. (For socket position, please refer to [3.5.1 paper holder appearance](#))

4.3 Connecting the grounding wire

To ensure that the printer has a nice grounding status, please follow figures below to connect the grounding wire.

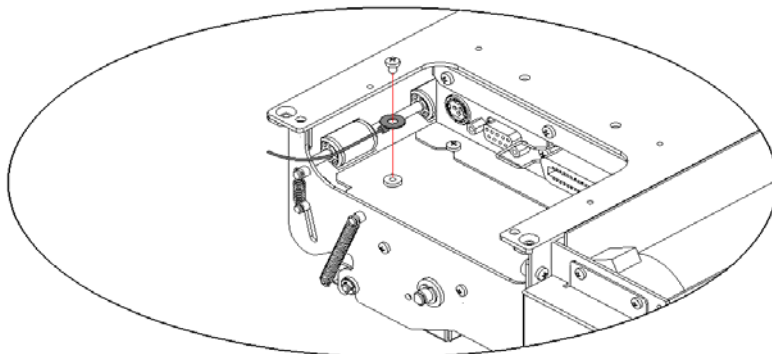


Figure 4.3 connecting the ground wire

4.4 Connecting the AC power adapter

- 1) Make sure the printer is turned off.
- 2) With the flat side of cable pin of AC adapter facing downward, plug the cable pin into the power interface on the bottom of the printer.
- 3) Connect the AC power cable to a nearby electrical outlet.

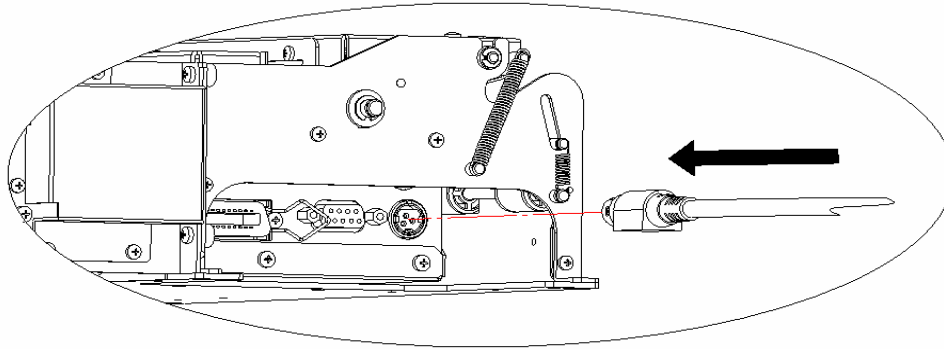


Figure 4.4 Connecting AC adapter



Caution

- ◇ Use recommended power adapter or the one with the same quality.
- ◇ Connect power adapter connector at right angle between pin and socket.
- ◇ When connecting or disconnecting the cable connector of the AC adapter, always hold the connector shell and don't pull the cable forcibly.
- ◇ Avoid dragging or pulling the cable of AC adapter, otherwise the cable may be damaged or broken and a fire and electric shock may be caused accordingly.
- ◇ Avoid placing the AC adapter near an overheating device; otherwise the cover of the cable may melt and cause a fire or electric shock.
- ◇ If leaving the printer idle for a long time, please disconnect the power of AC adapter of printer.

4.5 Connecting interface cable

- 1) Make sure that the printer has been shut down, that is, sign "O" in power switch is pressed down.
- 2) Connect one end of the interface cable into a relevant interface of the printer and fix them with screws or latch springs as figure 4.5, figure 4.6 and figure 4.7.
- 3) Connect the other end of the interface cable to the computer.

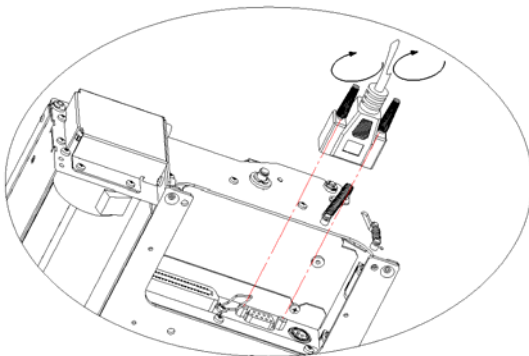


Figure 4.5 Connecting serial interface cable

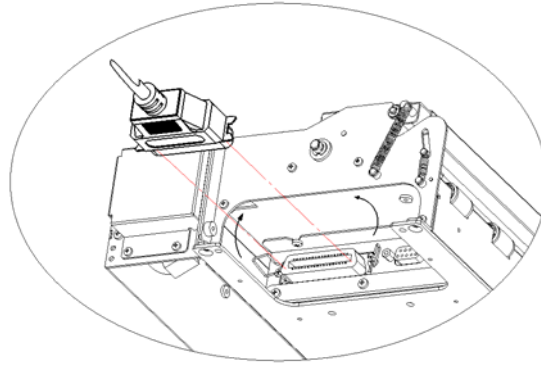


Figure 4.6 Connecting parallel interface cable

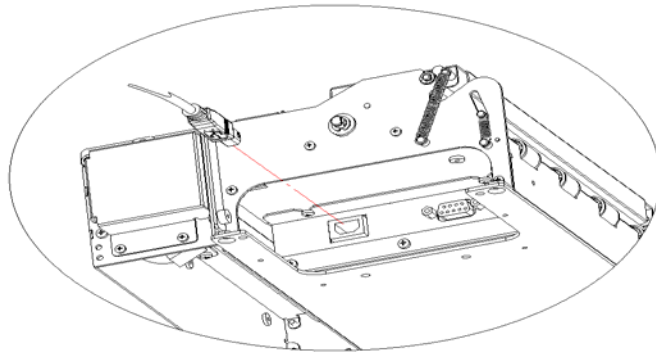


Figure 4.7 Connecting USB interface cable

**Notice:**

- ◆ Make sure the interface cable is connected in correct direction.
- ◆ When connecting serial interface cable, do not forget to tighten the fixing screws. For parallel interface cable, make sure to close the clips.
- ◆ When connect or disconnect the interface cable, make sure to hold the plug shell instead of the dragging the cable forcibly.

4.6 Loading paper roll

Before starting to load the paper roll, confirm whether the paper specifications are in conformity with printer requirements (refer to [2.2 paper specification](#))

4.6.1 Loading process

- 1) Before starting to load the paper roll, please check whether the paper width is 210mm or 216mm and decide whether paper roll fixing board is needed according to paper width.

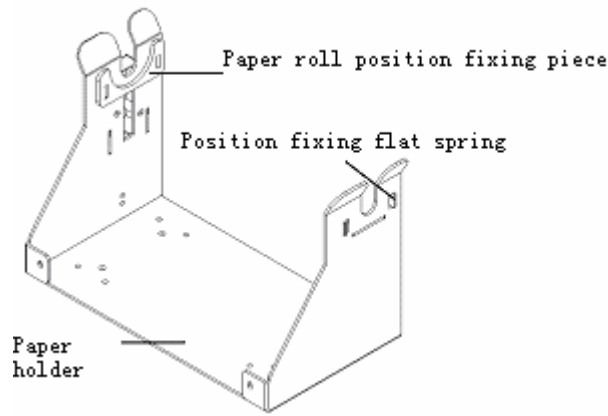


Figure 4.8 Paper roll position fixing piece

If the paper roll is 210mm wide, paper roll position fixing piece is needed. To install the paper roll position fixing piece, please latch position fixing flat spring into the holes in paper holder.

If the paper roll is 216mm wide, paper roll position fixing piece is not needed. To remove the paper roll position fixing piece, please move position fixing flat spring to center and get it off.

2) Insert the paper roll holding shaft into the core of the paper roll as the following figures:



Figure 4.9 Explanation for installing paper roll holding shaft

3) Make sure that the paper winding direction is backward and then put the paper roll onto the paper holder.

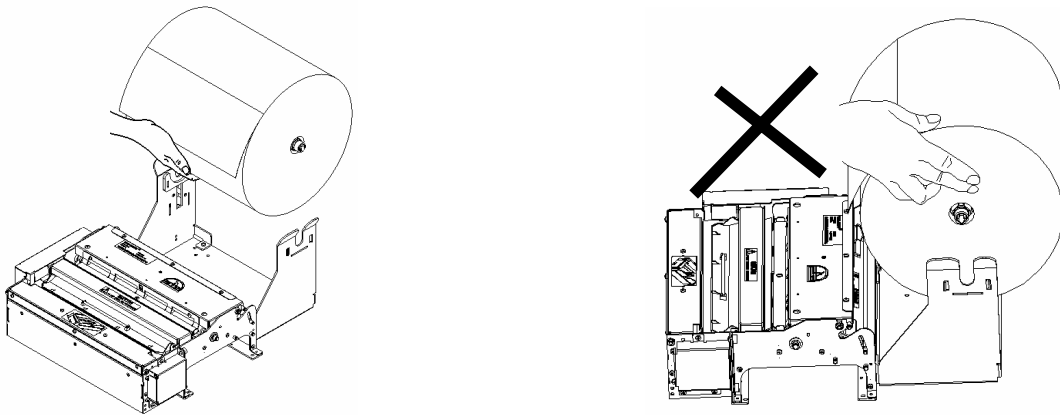


Figure 4.10 Explanation for loading paper roll



Note:

Avoid the mistaken operation not to hurt fingers

- 4) Cut the paper neatly by consulting the figure below

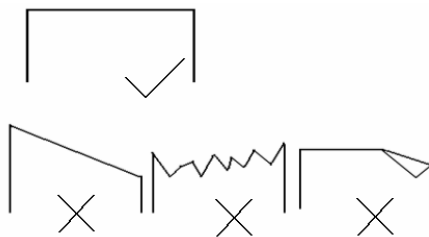


Figure 4.11 Paper head explanation

- 5) Sliding the paper guider to appropriate position (scale: 210mm or 216mm) according to paper width.

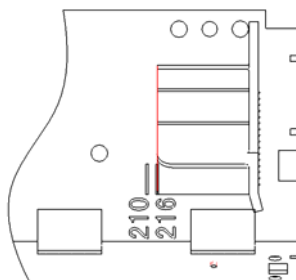


Figure 4.12 Adjusting paper guider explanations

4.6.2 Semi-automatic paper loading or manual paper loading

1. Semi-automatic paper loading

- 1) Turn on the power. The buzzer will beep for paper end.
- 2) See the figure below, inset the front end of the paper roll smoothly through the paper feeding path and loose hands when platen roller starts running and holds the paper.
- 3) The printer starts to load paper. After paper loading is finished, paper head halts at normal printing position, and then printing task can be performed.

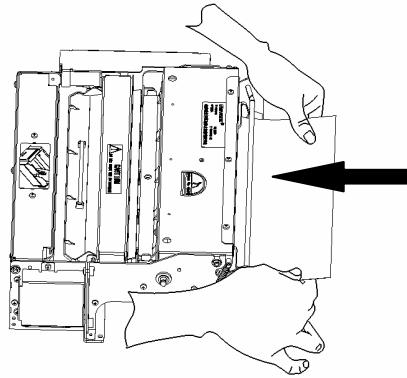


Figure 4.13 Semi-automatic paper loading



Notice

- ◆ The paper head shall go through the horizontal positioning shaft (vertical structure doesn't have this shaft).
- ◆ The paper shall go through between the up and down sliding plates of paper guide.

- 1—positioning shaft (for horizontal structure only)
- 2—sliding plates

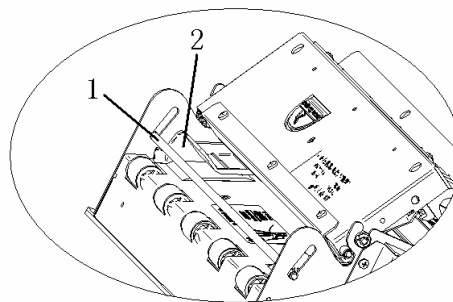


Figure 4.14 Paper loading explanation

2. Manual paper loading

- 1) Turn on the power and the buzzer will alarm paper end.

- 2) Press down the button on the print upper cover, and lift the print head.
- 3) Manually load paper as following figure, and make sure that the printing platen roller is fully covered by paper.
- 4) Close the print head. The printer will automatically feed paper to right position.

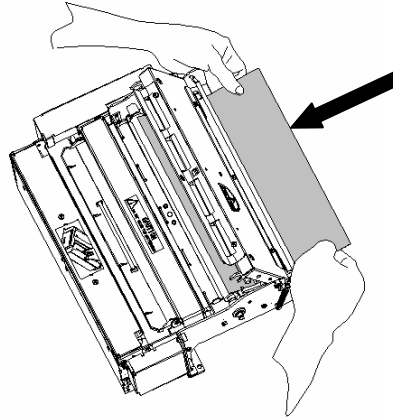


Figure 4.15 Manual paper loading

4.7 Installing the printer

BK-L216 printer is designed for embedded application.

1) Installation notes:

- Install the printer on a flat and stable place. Recommend to use horizontal installation. The inclination shouldn't exceed $\pm 15^\circ$ (paper feeding direction) when inclination installation is done. Inclination in other directions is strictly forbidden.
- Keep the printer far away from water source
- Do not place the printer in the place exposed to vibration and impact.
- while operating and doing routine maintenance, we suggest reserving the space as follows (figure 4.16、4.17、4.18) in order to guarantee printer working reliability and easy operation efficiently.

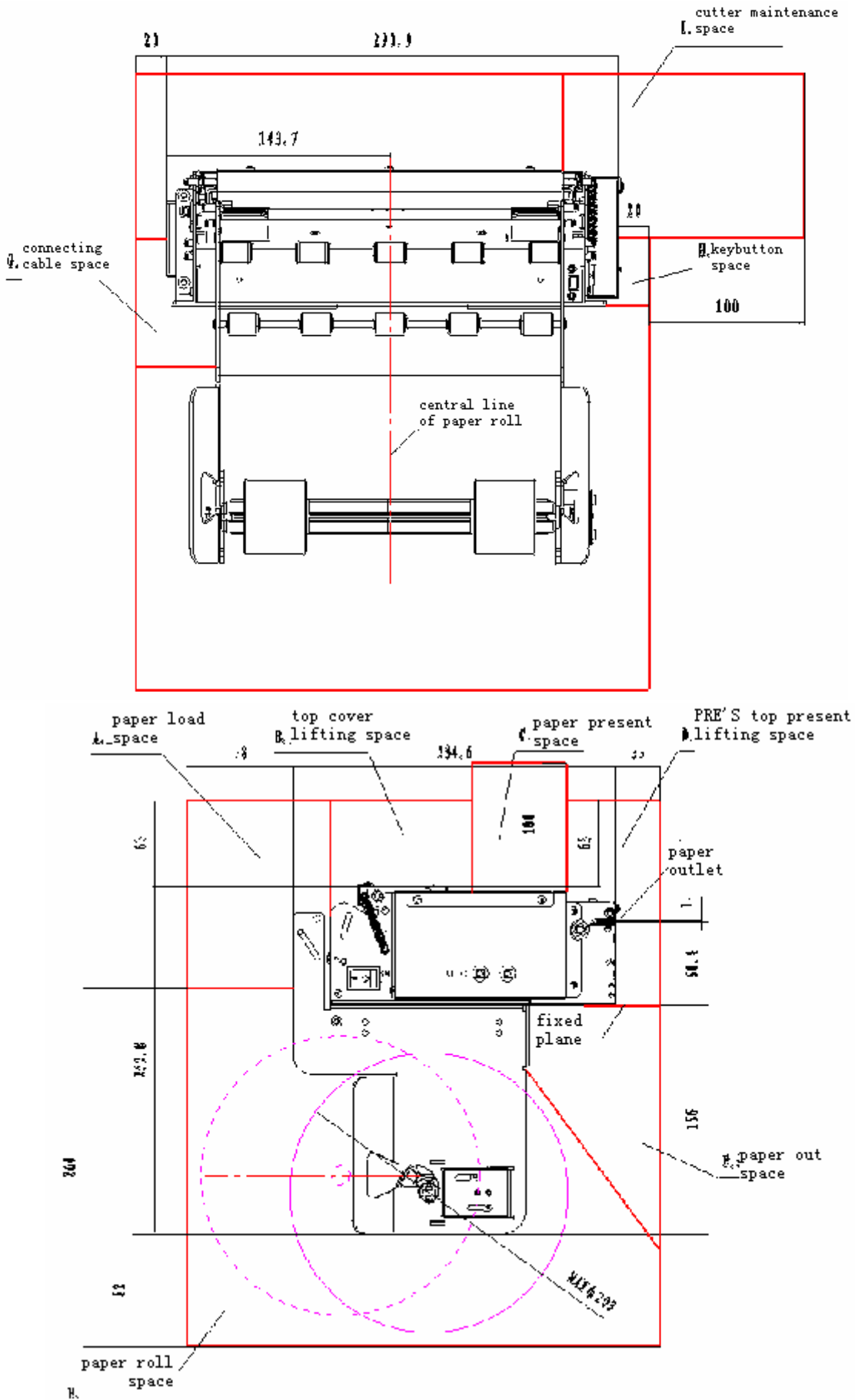


Figure 4.16 Vertical structure

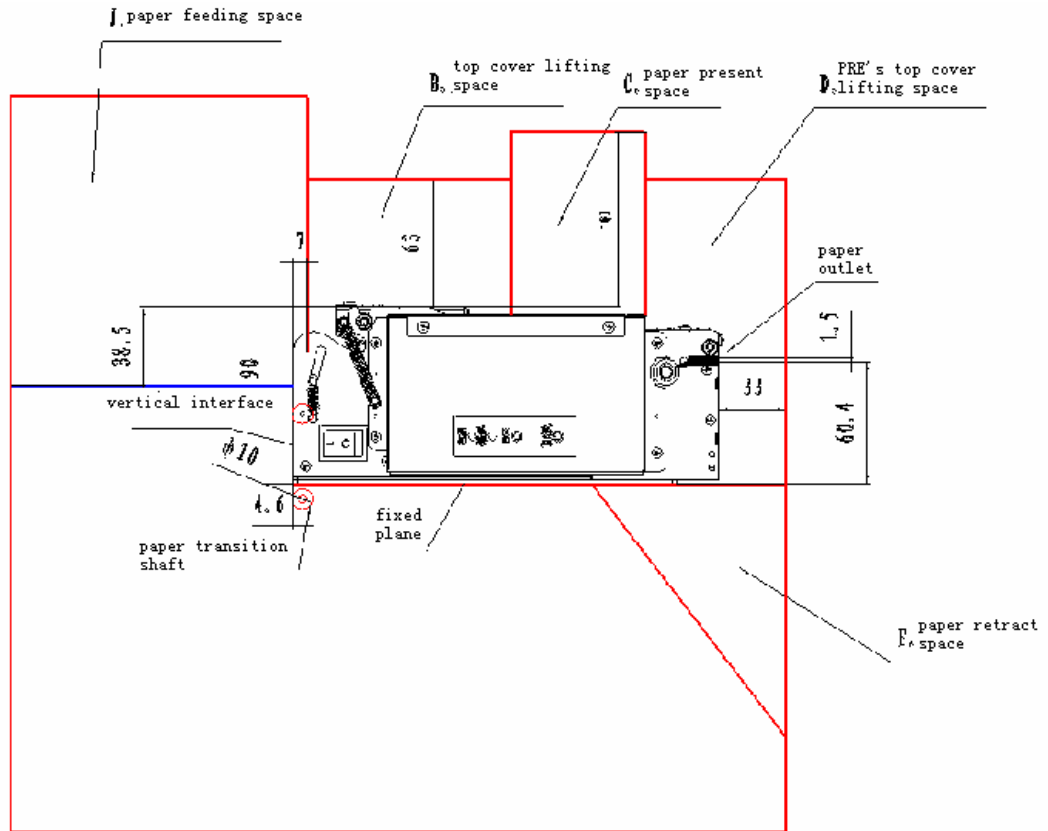


Figure 4.18 Structure without paper holder

Note:

- ◆ Spaces in above figure are as follows: printer work space, printer routine maintenance space and printer operating space. Printer work space include paper accommodating space and paper backing space; Printer routine maintenance space include PRE's upper cover opening space, upper cover opening space and cutter routine maintenance space; Printer operating space include paper roll loading space, paper loading space , button space and connection wire space.
- ◆ The dimension given in above figures is only for references.
- ◆ To ensure reliable paper accommodating, enough space should be left. There shall be no sharp edges, corners or edges around the space to avoid the printout damaged.

2) Spaces explanation

- ◆A: paper loading space; make sure to reserve enough space for semi-automatic paper loading.
- ◆B: upper cover uplifting space. Make sure to reserve enough space to enable the upper cover open.

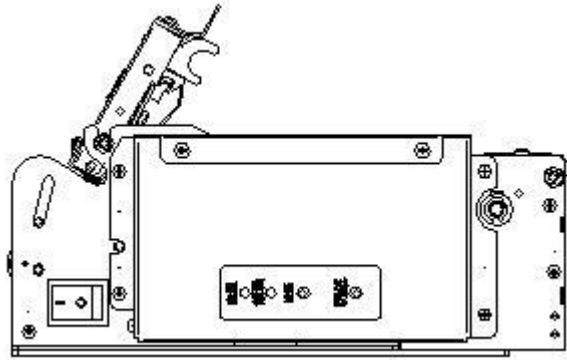


Figure 4.19 Upper cover opening

◆C: Paper accommodating space. Make sure to reserve enough space for the PRE turning board uplifting and paper looping height (For A4 size paper, the looping height is around 100mm);

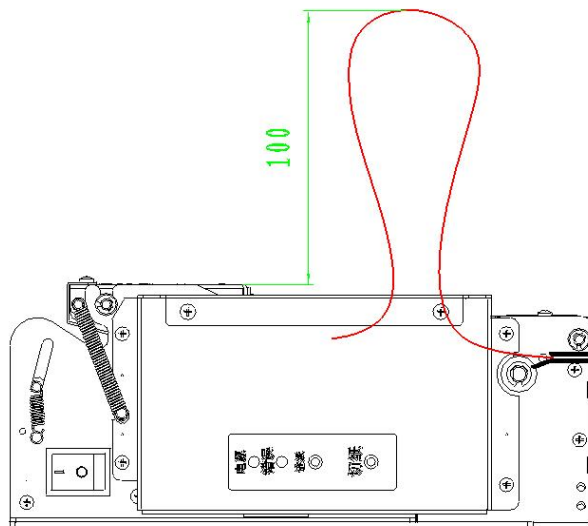


Figure 4.20 Paper looping

◆D: PRE upper cover uplifting space. Make sure to reserve enough space for Pre upper cover to lift up and loose.

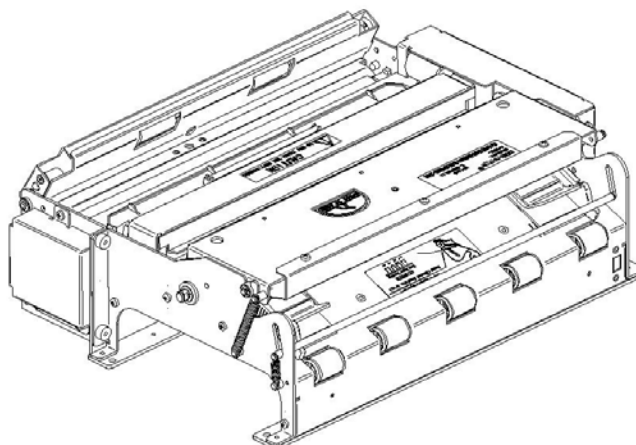


Figure 4.21 PRE upper cover lift up

- ◆E: Paper rolls loading space. Make sure to reserve enough space to load paper roll.
- ◆F: paper backing space. Presenter module waits for the user to take the paper away. If the user does not need the paper , the paper backs to the dustbin of the machine, Paper backing mouth should be left when the machine is fixed (as figure4.22, paper backing mouth is positioned with fixing hole .The hole you design had better be bigger the one in the figure). If your printer doesn't have paper backing function, just neglect this point.

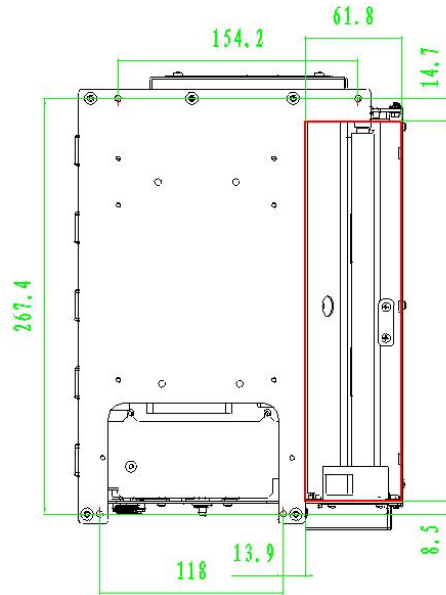


Figure 4.22 Paper retraction outlet

- ◆G: connection wire space. make sure there are enough space to connect and disconnect power cable and communication cable of print mechanism;
- ◆H: button space. make sure there are enough space to finish the operation of the CUT button, FEED button and power switch;
- ◆I: cutter maintenance space. make sure there are enough space to finish the disassembly of the protective cover and the operation of cutter manual resetting.(For maintenance method , please see section 5.4);
- ◆J: paper feeding space allowed by the paper roll. If your printer doesn't have paper holder or the paper holder is made yourself, please consider the space. (figure 4.18) There is a blue line in the space. If paper feeding is controlled above the blue line, your printer is considered to be horizontal .Or else, it is vertical. For horizontal type, you had better control the paper roll above the space, mainly in order to use the buffer mechanism of print mechanism to avoid compression. For vertical type, Please add buffer mechanism to paper holder (as figure4.23). In addition, if paper feeding touches vertical critical interface (as figure4.18) , please add paper transition roller to the paper holder in order to avoid that paper touches metal parts directly , causing paper damaged.

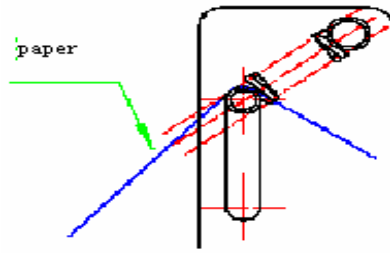


Figure 4.23 Buffer explanation

3) Notes for paper holder separate installation

If available, install the printer and paper holder together. If the paper holder has to be installed separately because of limited space, to ensure the reliability of paper feeding, please pay attention to following items:

- ◆ For installation dimension, please refer to the explanation of “J” in last section ;
- ◆ Keep paper path expedite, avoid sharp folder to cause overload;
- ◆ Avoid that paper rubs with sharp object, in order to prevent paper thermal layer damaged;
- ◆ Make sure that paper keeps certain pressure to printer elastic shaft to get buffer effect.
- ◆ Make sure that paper center is in consistent with the center of the paper feeding path, in order to prevent paper form going to one side during feeding and printing. (For position dimension, please see shape dimension in section 3.2)
- ◆ The intensity of the paper holder and paper shaft should be parallel with printer head, cutter etc.

4) Notes when designing external paper out path

In your system, it may be necessary to connect paper out path to match with the printer. To make sure paper feeding is smooth, we suggest design project in the place where external paper out path matches with the printer (as figure 4.24), and request that the paper-feeding path is smooth without burr, sharp corner and tuber.

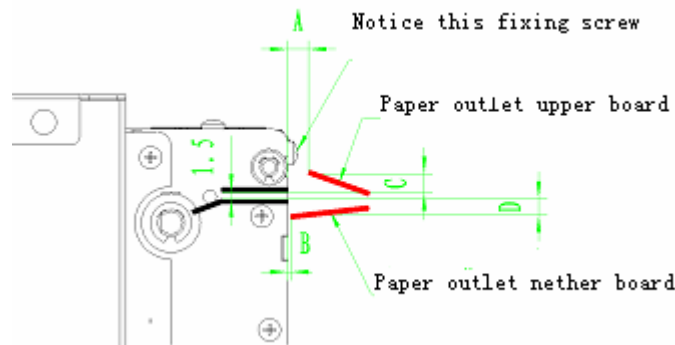


Figure 4.24 Paper outlet explanation

- ◆ Upper board “A” dimension of paper out path should be controlled from 4.5 to 5.5 mm and “C” dimension should be from 4 to 5mm. This is mainly to avoid the interference when the upper cover of PRE uplifts, and also to avoid interference with the fixing screw (M2.5) of the PRE upper cover.
- ◆ Nether board B dimension of paper out path is controlled to be within 1mm, and D is from 2 to 4mm.

Notice:

- ◆ The paper outlet shown in figure is just a sketch map; the paper outlet angle can be designed according to actual need. But try to avoid the paper outlet bend in order to increase the smoothness of the paper path.
- ◆ We leave fixing holes in printer mechanism for connecting paper out path for you as figure 4.25 (Notice the position of four fixing screw):

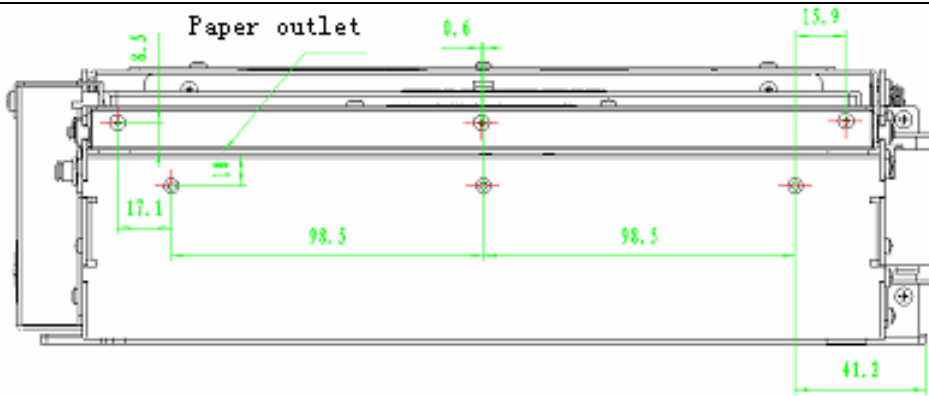


Figure 4.25 Fixing holes

- ◆ If you need to use our fixing holes, Please design the size of paper out path according to above request strictly. If your paper outlet is not assembled on the printer, that is, the paper outlet can be separated with printer during maintenance, “A” and “C” dimension needn’t be as the figure so strictly.
- ◆ If you design paper jam preventing mechanism in paper outlet, the paper outlet can be designed as figure 4.26. But as a result of the design, the paper can’t fall off automatically during paper out. You can design it in other shapes, but try to keep the smoothness of the paper outlet.



Figure 4.26 Paper outlet preventing jammed paper

4.8 Installing printer driver

The printer supports standard WINDOWS and LINUXs driver and serial driver and parallel driver both support System platforms such as WINDOWS95/98/NT4.0/2000/XP/LINUX.USB driver supports System platforms such as WIN98/2000/XP/LINUX. The current edition of the WINDOWS driver is V1.0. (For setup and use of the driver, please refer to the help document in the drive software package)



Figure 4.26 WINDOWS driver installation interface

5. Routine maintenances



Caution:

1. Before starting routine maintenance for the printer, make sure the power is turned off.
2. Do not touch the surface of print head with hands or metal. Do not use forceps so as to prevent print head, platen roller and sensors being scratched.
3. Do not use organic solvent like gasoline, acetone and etc.
4. When cleaning print head or sensors, please wait for pure alcohol to evaporate totally before starting printing
5. It is recommended to do routine maintenance per month

5.1 Cleaning print head

When the following cases occur, the print head should be cleaned:

- ✧ Printout is not clear;
- ✧ Some columns on the page are not clear;
- ✧ Paper feeds or retracts with big noises.

To clean the print head, follow steps given below.

- 1) Turn off the power and open the upper cover;
- 2) Lift print head module and wait for print head to cool down totally when it has just finished printing;
- 3) Wipe off dust and stains on the surface of the print head with soft cotton cloth dipped with pure alcohol. The cotton cloth shall be wrung before using.
- 4) Wait for 5 to 10 minutes until pure alcohol evaporates totally, press down print head module and close upper cover.

5.2 Cleaning sensors

5.2.1 Cleaning paper end sensor

When any of following cases occurs, the sensors should be cleaned.

- 1) During printing, the printer sometimes stops printing and alarms paper end when there is paper in fact.
- 2) The printer doesn't alarm paper end when paper is out
- 3) The printer doesn't identify marks correctly

To clean paper near end sensor, follow the steps given below:

- 1) Turn off the power, open print head upper cover.
- 2) Lift the print head and find out paper end sensor according to the printer figure;.
- 3) With soft cotton cloth dipped with pure alcohol, carefully wipe off stains on the surfaces of sensors.
- 4) Wait for 5 to 10 minutes until pure alcohol evaporates totally, press down the print head and close upper cover.

5.2.2 Cleaning paper loading sensor

When any of the following case occurs, paper loading sensor should be cleaned.

- 1) The paper can't back to normal printing position during semi-automatic paper loading.
- 2) Print motor reverse backward for long time during semi-automatic paper loading.
- 3) After printing is finished, the paper can't return to normal printing position.

To clean paper-loading sensors, following the steps given below:

- 1) Turn off the power and open print head upper cover

- 2) Uplift the print head and find out paper loading sensor according to the printer figure;
- 3) With soft cotton cloth dipped with pure alcohol (should be wrung), carefully wipe off stains on the surfaces of sensors.
- 4) Wait for 5 to 10 minutes until pure alcohol evaporates totally, press down print head and close printer upper cover.

5.2.3 Cleaning paper out sensor

When any of the following case occurs, paper out sensor should be cleaned.

- 1) PRESENTER can't hold paper normally.
- 2) PRESENTER can't perform paper backing function after holding paper.

To clean paper near end sensor, follow the steps given below:

- 1) Turn off the power and open PRESENTER upper cover;
- 2) Find paper out sensor according to printer figure;
- 3) With soft cotton cloth dipped with pure alcohol (should be wrung), carefully wipe off stains on the surfaces of sensors.
- 4) Wait for 5 to 10 minutes until pure alcohol evaporates totally, and close PRESENTER upper cover.

5.3 Cleaning printing platen roller

When any of the following case occurs, the sensor should be cleaned.

- 1) Print out is not clear;
- 2) Some columns on the page are not clear;
- 3) Paper feeds or retracts with big noises.

To clean printing platen roller, follow the steps given below:

- 1) Turn off the power;
- 2) Wait for a few minutes until print head cools down if the printer has just finished printing;
- 3) With soft cotton cloth dipped with pure alcohol (should be wrung), carefully wipe off stains on the surfaces of printing platen roller.

5.4 Manual resetting cutter

When one of the following cases occurs, manual resetting cutter should be done.

- 1) The cutter can't cut off the paper; cutter doesn't go to home position; cutter doesn't act.
- 2) Paper jams because the cutter doesn't go to home position. Press CUT button, but cutter doesn't act.

Reset cutter manually in the following steps:

- 1) Turn off printer power;
- 2) Remove the protective board cover;
- 3) Use cross screwdriver to rotate motor shaft, push cutter guider forward (or there is big gap between upper and nether blade) as figure 5.1.

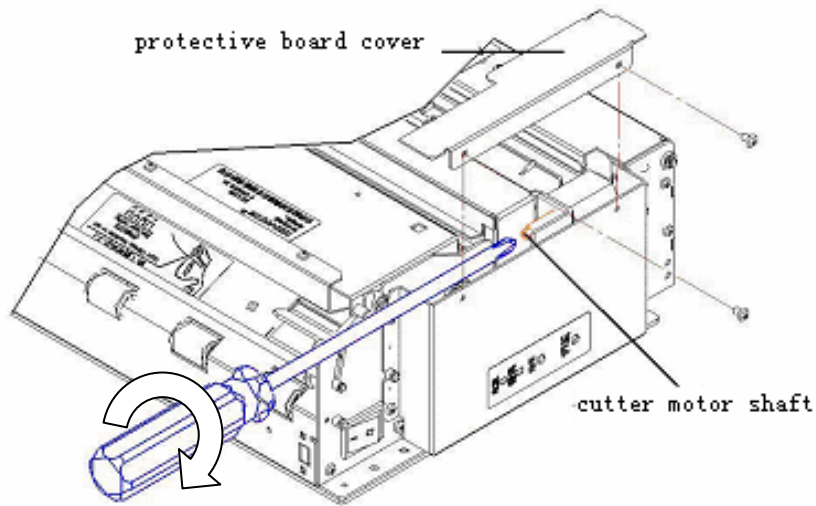


Figure 5.1 Manually reset cutter

5.5 Manual removal of the jammed paper

When any of the following errors occurs, please remove jammed paper manually.

- (1) Paper jams between platen roller and cutter holder.
- (2) Paper accumulates at paper inlet of the cutter in the front of print head.
- (3) The cutter can't cut off paper.

Remove jammed paper in the following steps:

- (1) Open printer upper cover;
- (2) Pull out the jammed part of paper; if the cutter doesn't go to its home position, please refer to [5.4 manual reset cutter](#) to reset the cutter.
- (3) Cut off the folded part of paper;
- (4) Reload the paper.

6. Interface signal

6.1 RS-232 Interface

6.6.1 Parameter

- data transfer mode : asynchronous serial communication
- handshake mode: **RTS/ CTS** control
- voltage level: MARK = -3 to -15 V: Logic "1"/ OFF
SPACE = +3 to +15 V: Logic "0"/ ON
- baud rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600 bps
- data bit: 8bit or 7bit
- Parity bit: None, even, or odd
- Stop bit: 1bit
- connector : 9 pins serial connector(negative head)



Caution: baud rate, data bit and parity bit are set by EEPROM.

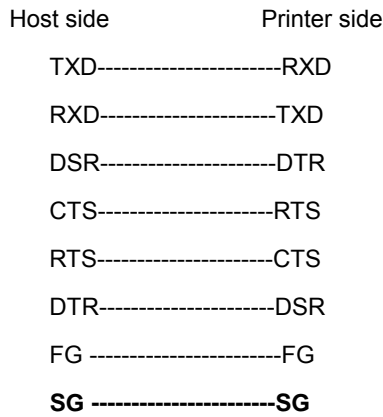
6.1.2 Interface linking terminal distribution and signal function

Printer signal and status is described as the following table:

PIN NO	Signal name	Signal direction	function
1	NO		
2	RXD	input	Data input end
3	TXD	output	Data output end
4	DTR	output	Data terminal is ready
5	SG	—	Signal ground
6	DSR	hang	Data device is ready
7	RTS	output	Request to send
8	CTS	input	Allow to send
9	FG	—	printer cover ground

Table 6.1 Interface and pin explanation

6.1.3 Demonstration of Interface connection



Caution: please make sure the printer is turned on and waiting for the end of initialization, then send data to the printer.

6.2 IEEE1284 Parallel interface (optional)

RS-232 serial interface is the standard interface of the printer, and IEEE 1284 Parallel interface is the optional one, and works in compatible mode (For interface position, please refer to figure [3.12 serial interface configuration model](#)).

6.2.1 Parameter

- Data transfer: 8 bits Parallel
- Synchronization mode: nStrobe signal is provided by exterior
- Handshake mode: Busy signal
- Signal voltage level: TTL compatible
- Connector: 36 pins inner empty type Centronics connector in accord with the IEEE1284 agreement

6.2.2 The influence of printer status to parallel interface (/FAULT pin and PE pin)

Status	/FAULT	PE
Normal	high	low
Paper end	low	high
Print head overheated	low	low
upper cover open	low	low
Cutter error	low	low

Table 6.2 /FAULT pin and PE pin explanation

When above errors occur, information can be got by reading the status of correlative pins of parallel interface.

6.2.3 Parallel interface signal

Pin No.	Source	Compatible mode
1	H	nStrobe
2	H	Data 0 (Least Significant Bit)
3	H	Data 1
4	H	Data 2
5	H	Data 3
6	H	Data 4
7	H	Data 5
8	H	Data 6
9	H	Data 7 (Most Significant Bit)
10	P	nAck
11	P	Busy
12	P	Perror
13	P	Select
14	H	nAutoFd
15		Not Defined
16		Logic Ground
17		Chassis Ground
18	P	Peripheral Logic High
19		Signal Ground (nStrobe)
20		Signal Ground (Data 0)
21		Signal Ground (Data 1)
22		Signal Ground (Data 2)
23		Signal Ground (Data 3)
24		Signal Ground (Data 4)
25		Signal Ground (Data 5)
26		Signal Ground (Data 6)
27		Signal Ground (Data 7)
28		Signal Ground (PError, Select, and nAck)
29		Signal Ground (Busy and nFault)
30		Signal Ground (nAutoFd, nSelctIn, and nInIt)
31	H	nInIt

32	P	nFault
33		Not defined
34		Not defined
35		Not defined
36	H	nSelectIn

Table 6.3 Parallel interface signal definition

Note: (1) H stands for host computer terminal, and P stands for printer terminal.

(2) Parallel Interface Signal use TTL voltage level. When it is used, please make sure both the rise and drop time of host computer terminal is not longer than 0.5us.

(3) When data transfers, the host computer should not ignore the busy signal, or else the print data may be lost.

(4) The length of parallel interface connection wire should be as short as possible if it meets use requirement.

6.2.4 Time sequence of data receiving

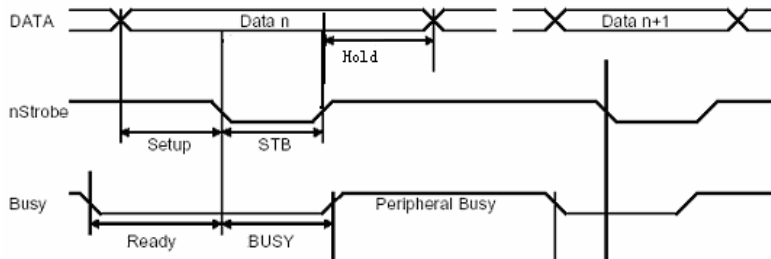


Figure 6.1 Time sequence of parallel interface data receiving

Signal time demands:

signal	min (ms)	max (ms)
setup	0.75	-
ready	0	-
stb	0.75	500
busy	0	2.5
hold	0.75	-

Table 6.4 Demand explanation of interface signal

6.3 USB interface (optional)

RS-232 serial interface is the standard interface of the printer, and USB interface is an optional one which accords with USB 1.1 agreement standard, and work in full speed mode (For interface position, please refer to figure [3.13 USB interface configuration model](#)). Data transfer bit rate is 12Mbps. USB transfers signal and power by a kind of four-line cable. D+ and D- connection wires in figure 6.2 are used to send signal.

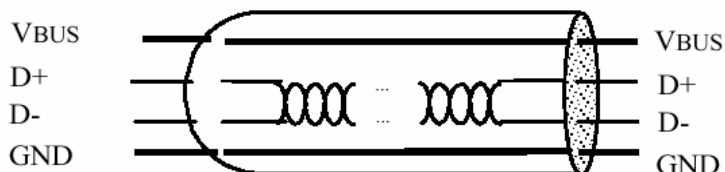


Figure 6.2 USB Cable

6.4 Power interface

This connector is used to connect the printer with external power supply.

The pin distribution of power connector:

PIN	Signal name
1	+24V
2	GND
3	NC
SHELL	F.G.

Table 6.5 Power pin definition explanation

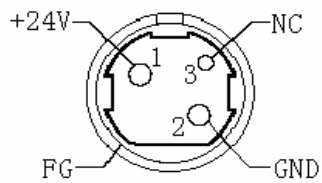


Figure 6.3 Power supply pins

7. Troubleshooting and maintenance

If errors occur in the printer, consult the troubleshooting table below. If still can't settle the trouble, please contact with our agent or manufacturer.

7.1 Common errors and settlement

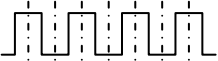

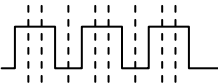
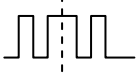


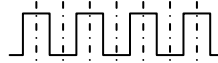
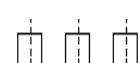
Error	Description	Display mode of error LED $> < 200ms$	Buzzer $> < 200ms$	Recovery
Print head overheated	Temperature of print head is too high			If temperature is fallen, auto recovering
Print head uplifting	Print head is lifting up			Put down the print head, auto recovering
Paper end	Paper Sensor detects paper end			Reload paper, auto recovering
Cutter error Paper jam	Paper jams or Cutter can't work normally			Remove the jammed paper and press CUTTE key and cut paper

Table7.1 Error index

Printer acts as follows when errors occur:

Stop printing;

Busy signal is available;

Error LED glitters;

The buzzer beeps.

7.2 Settlement for common errors

7.2.1 Problems during paper loading

Problem	Possible reasons	How to settle
Paper roll can't be loaded into paper holder.	The paper roll width and diameter do not meet the requirements of the printer	Replace the paper
The printer can't feed paper automatically.	Paper head is irregular ; Paper jams; The paper load sensor is not covered by paper head Dust or wastepaper covers the paper loading sensor	Clear wastepaper according to requires. Remove jammed paper. Check the front end of paper to confirm that the paper-load sensor is covered fully by paper. Clean the paper load sensor
The buzzer alarms	Paper is end The printer cover is not fully closed.	Replace the paper roll. Close printer upper cover fully.
After auto paper feeding ,the paper can't stop in the normal print position	Dust or wastepaper covers the paper loading sensor	Clean the paper loading sensor.

Table 7.2 Paper feeding problem index

7.2.2 Problems during printing

Problems	Possible reasons	How to deal with
The receipt can't be ejected out smoothly.	<ul style="list-style-type: none"> ◇ Paper jams 	<ul style="list-style-type: none"> ◇ Open print unit upper cover and presenter upper cover, check paper path, remove wastepaper and reload paper automatically.
Printout is not clear.	<ul style="list-style-type: none"> ◇ The thermal paper is loaded in wrong direction or it's of poor quality. ◇ Print head needs cleaning. ◇ Printing darkness is too low. ◇ Input voltage is too low. 	<ul style="list-style-type: none"> ◇ Make sure the paper roll is loaded correctly ◇ Use recommended paper or its equivalents. ◇ Clean the print head. ◇ Adjust print darkness(*) ◇ Use the power supply which meets requires
Cutter works abnormally.	<ul style="list-style-type: none"> ◇ Paper jams in cutter. ◇ The cutter is broken. 	<ul style="list-style-type: none"> ◇ Check if there are sundries in cutter path (*). ◇ Contact with the manufacturer or your local distributor.
Printing data is lost and no printing.	<ul style="list-style-type: none"> ◇ The printer cover is closed improperly. ◇ Paper jams. 	<ul style="list-style-type: none"> ◇ Close printer upper cover properly. ◇ Remove paper jam

Table 7.3 Print problem index

*To adjust print darkness, please contact with our distributors or manufacturer.

*If paper jams in cutter, please remove the jammed paper first, and then press CUT button to reset the cutter.

7.2.3 Problems during paper out

Problems	Possible reasons	How to deal with
The printer stops printing and warns errors during printing.	<ul style="list-style-type: none"> ◇ Paper is end. ◇ Paper jams in cutter. ◇ Dust or wastepaper covers the paper near end sensor. 	<ul style="list-style-type: none"> ◇ Install a new paper roll. ◇ Check if there are sundries in cutter path. ◇ Clean the paper end sensor.

Table 7.4 Problem of out paper index

Note: Contaminated paper may cause detection failure.

7.2.4 Other problems

Problem	Possible reasons	How to deal with
LED isn't light and printer doesn't work.	<ul style="list-style-type: none"> ◇ The printer is not connected with the power supply correctly. ◇ The printer isn't turned on. 	<ul style="list-style-type: none"> ◇ Connect the printer with the power supply correctly. ◇ Turn on the printer.
The printer doesn't work after receiving commands.	<ul style="list-style-type: none"> ◇ Printer is in error status. ◇ The communication cable is not connected well. ◇ Interface setting is wrong. 	<ul style="list-style-type: none"> ◇ Remove all errors (*). ◇ Print a self-test page and set the interface again according to information on it. ◇ Make sure the communication cable is connected correctly.

Table 7.5 Other problems index

*Note: Paper near end alarm acts only as a prompt for users, not error status. Therefore when this alarm is given, printing task can still be sent.

Appendix

Appendix 1 Self test page

Print self test page in the following steps: Turn off printer power, then hold down the FEED button for at least 1 second while turning on the printer. The printer will start to print a self-test page. Take 300 dpi USB interface model for example, self test paper is as follows:

****BK-L2163 TEST FORM****

Boot Firmware	: 1.2
Main Firmware	: V03.02.01
H/W Parameters	
H/W ID	: BK-L2163 (U) 1
Flash Memory Size	: 1M bytes
Flash Logos Size	: 64k bytes
Resolution	: 300×300dpi
Valid Print Width (Max)	: 216mm
Print Speed (MAX)	: 75mm/s
Dark Scale	: 100
Cutter	: Enabled
Presenter	: Enabled
Presenter Mode	: Retraction
Presenter Wait Time	: 3s
Comm. Interface	
Rx Buffer Size	: 4096bytes
Interface Type 1	: RS232
Baud Rate	: 38400bps
Data Bit	: 8
Stop Bit	: 1
Parity	: NONE
Flow Control	: RTS/CTS
Interface Type 2	: USB
Command CR	: Ignored
Resident Fonts	: W×H
Standard Character	: 18X34
Compressed Character	: 13X24
Simplified Chinese	: 36X36
Bar Code Available	: UPC-A
	: UPC-E
	: EAN-8
	: EAN-13
	: CODE39
	: CODE93
	: ITF
	: CODABAR
	: CODE128

Explanation of self test page content:

Boot Firmware	: Printer BOOTLOADER version
Main Firmware	: Printer monitor program version
H/W Parameters	: Printer parameter setting
H/W ID	: Printer ID setting
Flash Memory Size	: Printer FLASH size
Flash Logos Size	: Flash size for bitmap downloading
Resolution	: Printer resolution
Valid Print Width (Max)	: Maximum print width
Print Speed (MAX)	: Print speed
Dark Scale	: Print darkness
Cutter	: Enable or disable auto cutter
Presenter	: Enable or disable PRESENTER
Presenter Mode	: PRESENTER paper out mode
Presenter Wait Time	: PRESENTER waiting time before retracting or ejecting the printout
Comm. Interface	: Communication interface setting
Rx Buffer Size	: Data receiving buffer zone size
Interface Type1	: Interface type
Baud Rate	: Serial communication baud rate setting
Data Bit	: Serial communication data bit setting
Stop Bit	: Serial communication stop bit setting
Parity	: Serial communication parity bit setting
Flow Control	: Serial communication data stream mode (handshaking type)
Interface Type2	: The second interface type
Command CR	: Enable or disable CR command
Resident Fonts	: Font setting
Standard Character	: Standard Character setting
Compressed Character	: Compressed Character setting
Simplified Chinese	: Big character set setting
Bar Code Available	: Printable bar code model

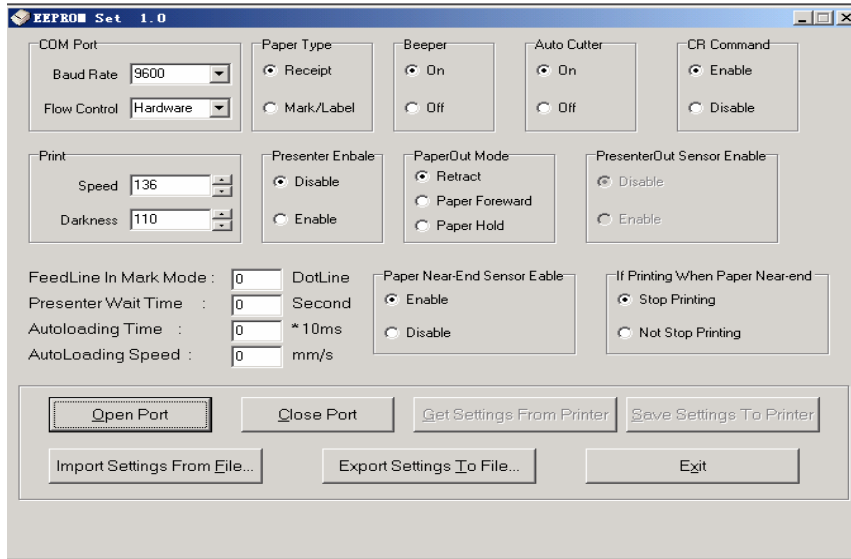
Appendix 2 Tool software

For BK-L216 printers, we provide the following tools: configuration software, debug software, demo software, download /upgrade program software and LOGOKIT tool. Their brief introduction is as follows.

Appendix 2.1 Configuration software

The EEPROM setting tool software is EEPROM SET, and its main function is to read and configure printer EEPROM. It is supported by WINDOWS95/98/NT4.0/2000/XP, the current edition is V1.0. The following is the main interface figure of EEPROM SET.

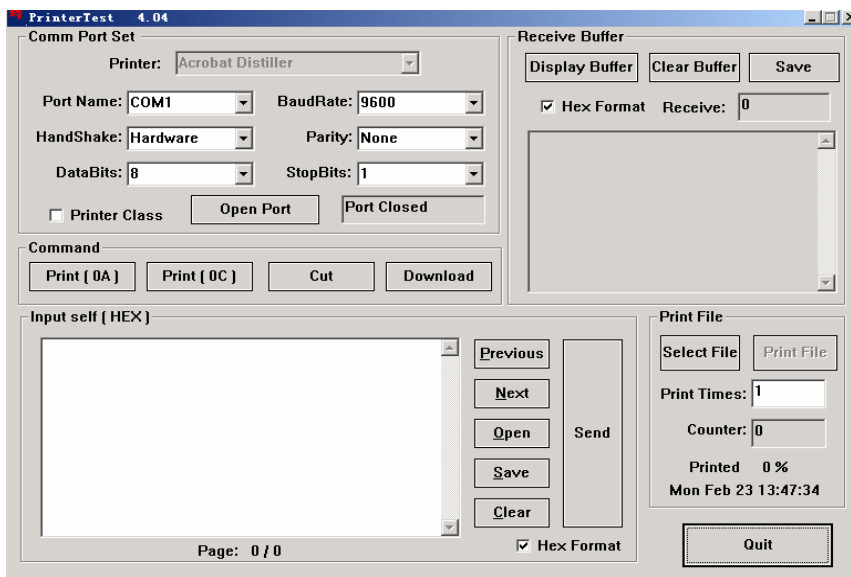
(For detailed use explanation, please refer to the explain documents in the tool software package)



Appendix figure 1 EEPROM SET interface

Appendix 2.2 Debugging Software

The debug software is PRINTERTEST and its main function to debug printers. It supports the following system platform: WINDOWS95/98/NT4.0/2000/XP. The following is the main interface figure of PRINTERTEST. (For detailed use explanation, please refer to the explain document in the tool software package)



Appendix figure 2 PRINTERTEST interface

Appendix 2.3 Demo program

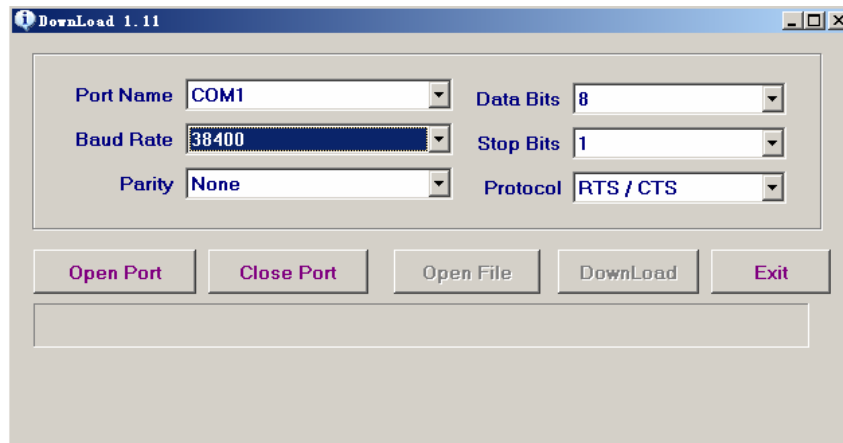
The demo program software is KIOSK PRINTE DEM, and its main function is to demonstrate the representative function of the printer. It supports the following system platforms: WINDOWS95/98/NT4.0/2000/XP, the current edition is V1.0. The following is the main interface figure of KIOSK PRINTER DEMO. (For detailed explanation, please refer to the explain document in the tool software package)



Appendix figure 3 KIOSK PRINTER DEMO interface

Appendix 2.4 Download/upgrade program software

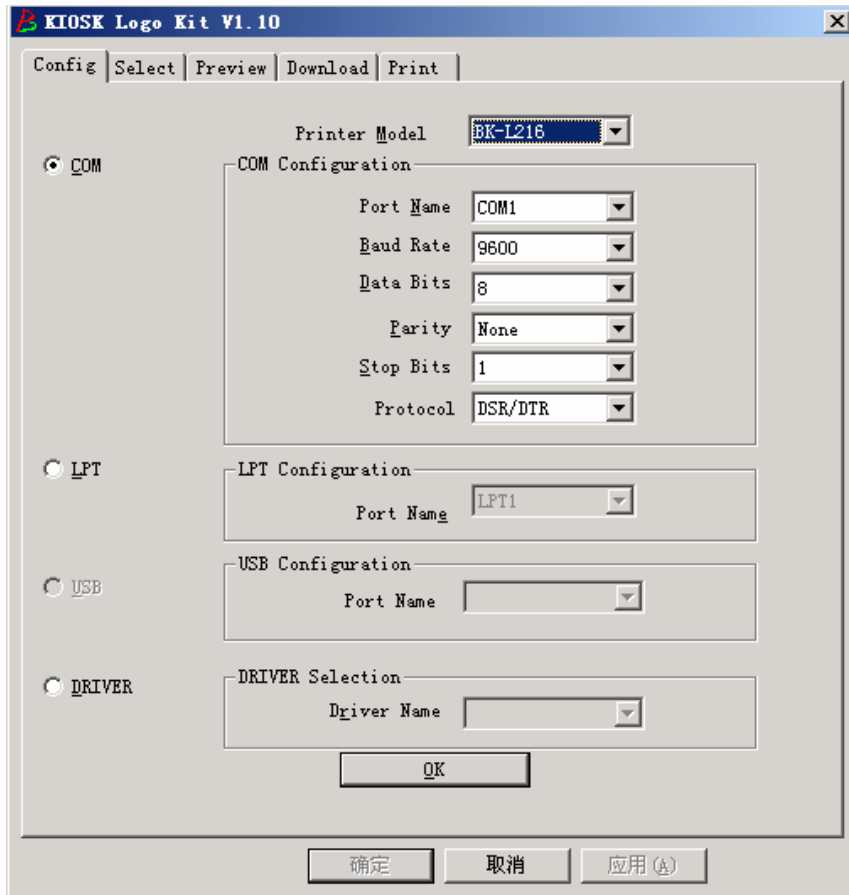
Download/upgrade program software is DOWNLOAD, and its main function is to upgrade monitor program, download the font set, print documents and so on. It supports the following system Platforms: WINDOWS95/98/NT4.0/2000/XP, the current edition is V1.11. The following is the main interface figure of DOWNLOAD (For detailed explanation, please refer to the explain document in the tool software package)



Appendix figure 4 DOWNLOAD interface

Appendix 2.5 LOGOKIT tool

LOGOKIT tool software is KIOSK LOGOKIT, and its main function is to download LOGO to printer RAM/Flash and can perform printing function. It supports the following system Platforms: WINDOWS95/98/NT4.0/2000/XP, the current edition is V1.10. The following is the main interface figure of KIOSK LOGOKIT (For detailed explanation, please refer to the explain document in the tool software package)



Appendix figure 5 KIOSK LOGOKIT interface