

KROY K4452/K4453

**Thermal Transfer / Direct Thermal
Bar Code Printer**

User's Manual

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Compliances

CE Class B:

EMI: EN 50081-1:1998->EN55022:1998, EN 61000-3-2:2000,
EN61000-4-3:1998

EMS: EN55024:1998

FCC Part 15, Class B

UL, CUL

C-Tick: Class B AS/ NZS 3584: 1997

TÜV-GS: EN60950: 2000

Important Safety Precautions

1. Please read these safety precautions carefully.
2. Keep these instructions for later use
3. Disconnect the printer from the power supply before cleaning. Do not use liquid or aerosol cleaners. A damp cloth is the most suitable item for cleaning the printer.
4. Make sure the power supply outlet is near to the printer and easily accessible.
5. The printer is to be protected from humidity.
6. Make sure the printer is installed on a level surface. Tilting or dropping the printer can cause damage.
7. When connecting to the power supply do not exceed the power requirements.
8. The printer can be operated up to a maximum external temperature of 40 °C.

1. Introduction

Thank you for purchasing the KROY K4452/4453series of Thermal Transfer and Direct Thermal Bar Code Printers. Although the printer takes only a small amount of space, it delivers reliable, superior performance.

This printer provides both thermal transfer and direct thermal printing at a user selectable speed of: 2.0, 3.0, 4.0 or 5.0 ips, /2.0 or 3.0 ips. It accepts roll feed, die-cut, and fan-fold labels for both thermal transfer and direct thermal printing. All common bar code formats are available. Fonts and bar codes can be printed in 4 directions, in 8 different alphanumeric bitmap fonts and with a built-in true type font capability. You will enjoy a high throughput for printing labels with this printer.

2. Getting Started

2.1 Unpacking and Inspection

This printer has been specially packaged to withstand damage during shipping. Please carefully inspect the packaging and printer upon receiving the bar code printer. Please retain the packaging materials in case you need to reshipe the printer.

2.2 Equipment Checklist

- Printer unit.
- Software CD.
- Sample ribbon roll.
- Sample label roll.
- Label spindle (1 inch diameter core).
- Label spindle fixing tab.
- 1.5 inch paper core adapter.
- Paper core.
- Ribbon supply/rewind spindle. (2 pcs.)
- Parallel port or USB cable.
- Auto switching power supply.
- Power cord.
- Quick start guide.

If any parts are missing, please contact the Customer Service Department of your purchased reseller or distributor.

Options

- External label roll mount.
- Label spindle (3-inch diameter core).
- Keyboard display unit (KU-007 series).
- Automatic cutter module.
- Peel off module.
- External Ethernet print server.
- 802.11b wireless print server.

2.3 Printer Parts

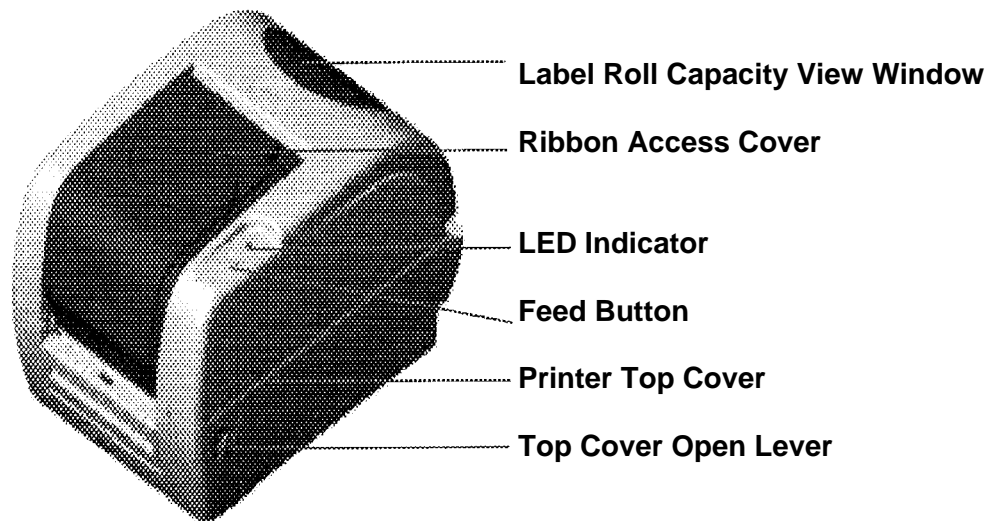


Fig. 1 Top front view

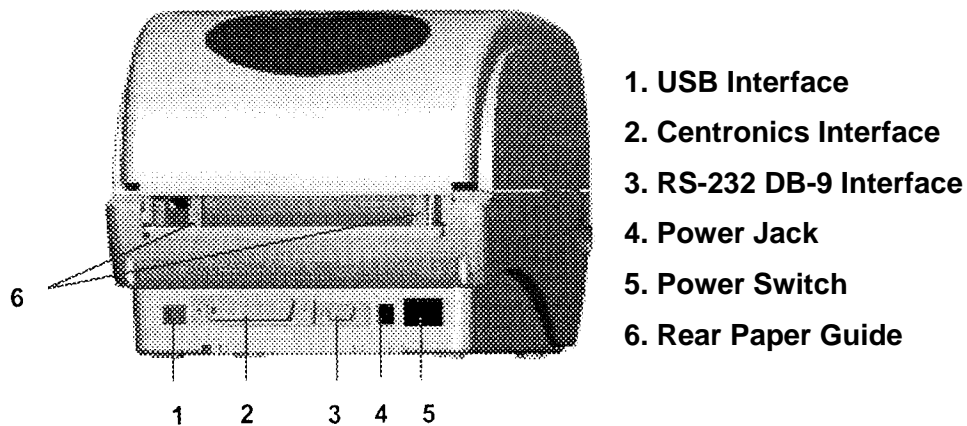


Fig. 2 Rear view

3. Power on Utilities

There are four power-on utilities to set up and test the printer hardware. These utilities are activated by pressing the FEED button and by turning on the printer power simultaneously. The utilities are listed below:

1. Gap or black mark sensor calibration
2. Label length calibration
3. Print self-test printout
4. Printer initialisation

3.1 Ribbon Sensor Calibration

The printer will calibrate the ribbon sensor sensitivity.

Please follow the steps below to calibrate the ribbon sensor.

1. Turn off the power.
2. Press and hold the feed button then turn on the printer power.
3. Release the button when the LED turns red after the first orange. (Any red will do during the 5 blinks).

The LED colour will be changed in accordance with the following pattern:

Orange → **red (5 blinks)** → orange (5 blinks) → green (5 blinks) → green

3.2 Gap/Black Mark Calibration

Gap/black mark sensor sensitivity should be calibrated when:

1. Operating a brand new printer for the first time
2. Changing the label stock.
3. Initialising the printer.

The printer calibrates Gap or Black Mark depending upon your last print job setting. Please follow the steps below to calibrate the sensor.

1. Turn off the power.
2. Press and hold the feed button then turn on the printer power.
3. Release the button when the LED turns orange. (Any orange will do during the 5 blinks).

The LED colour will be changed in accordance with the following pattern:

Orange → red (5 blinks) → **orange (5 blinks)** → green (5 blinks) → green

Whilst calibrating the gap/black mark sensor, the printer will measure the label length, print the printer configuration and then enter into dump mode.

3.3 Self Test

Before connecting the printer to your computer, you can print a test page to verify that the printer is in proper working order. It prints the print head check pattern and printer configurations and then enters dump mode.

Please follow the steps below to calibrate the sensor.

1. Turn off the power.
2. Press and hold the feed button then turn on the printer power.
3. Release the button when the LED turns orange. (Any orange will do during the 5 blinks).

The LED colour will be changed in accordance with the following pattern:

Orange → red (5 blinks) → **orange (5 blinks)** → green (5 blinks) → green

Turn the power off / on to resume normal printing.

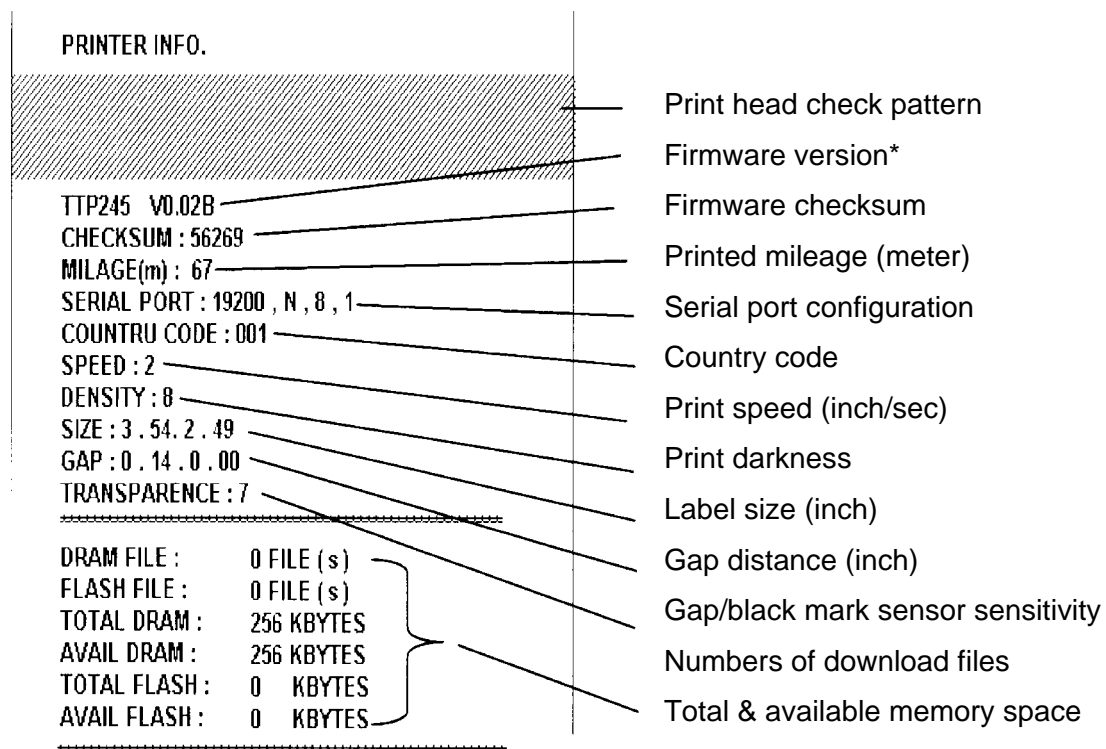


Fig. 3 Self-test printout

***A character, in the firmware version, is shown as the following:**

T: TSPL E: EPL2 D: DPL Z: ZPL U: USB supported

3.4 Dump Mode

The printer will enter dump mode after printing the printer configuration. In the dump mode, all characters will be printed in 2 columns as follows.

ASCII Data	<pre> SPEED 2.0 53 50 45 45 44 20 32 2E 30 0D DENSITY 8 0A 4A 45 4E 53 49 54 59 20 38 SET PEEL 0D 0A 53 48 54 20 50 45 45 4C OFF DIRE 20 4F 46 46 0D 0A 44 49 52 46 CTION 0 0 43 54 49 4F 4E 20 30 0D 0A 47 AP 3.00 mm 41 30 20 33 2E 30 30 20 0D 0A .00 mm 2C 30 2E 30 30 20 6D 6D 0D 0A REFERENCE 52 48 46 4E 52 4E 4E 43 45 20 0.0 SET C 30 2C 30 0D 0A 53 45 54 20 43 UTTER OFF 55 54 54 45 52 20 4F 46 46 0D SIZE 100. 0A 53 49 5A 45 20 31 30 30 2E 02 mm.05.0 30 32 20 0D 0D 2C 36 35 2E 30 4 mm CLS 34 20 0D 0D 0D 0A 43 4C 53 0D BARCODE 1 0A 42 41 52 43 4F 44 45 20 31 44.149."39 34 34 2C 31 34 39 2C 22 33 39 ".120."1.0. 22 2C 31 32 30 2C 31 2C 30 2C 2.6."57114 32 2C 36 2C 22 35 37 31 31 34 3BT" PRIN 33 30 54 22 0D 0A 50 52 49 4E T 1.1 SPE 54 20 31 2C 31 0D 0A 53 60 45 ED 2.0 DE 45 44 20 32 2E 30 0D 0A 44 45 NSITY 8 S 4E 53 49 54 50 20 38 0D 0A 53 ET PEEL OF 45 54 20 50 45 45 4C 20 4F 46 F DIRECTI 46 0D 0A 44 49 52 45 43 54 49 ON 0 GAP 4F 4E 20 30 0D 0A 47 41 50 20 3.00 mm.0. 33 2E 30 30 20 6D 6D 2C 30 2E 00 mm REF 30 30 20 0D 0D 0D 0A 52 45 46 ERENCE 0.0 45 52 45 4E 43 45 20 30 2C 30 SET CUTT 0D 0A 53 45 54 20 43 65 54 54 ER OFF SI 45 52 20 4F 46 48 0D 0A 53 49 ZE 100.02 5A 45 20 31 30 30 2E 30 32 20 mm.05.04 m 0D 0D 2C 36 35 2E 30 34 20 0D m CLS BA 0D 0D 0A 43 4C 53 0D 0A 42 41 RCODE 144. 52 43 4F 44 45 20 31 34 34 2C f49."39".1 31 34 39 2C 22 33 39 22 2C 31 20."1."2.0 32 30 2C 31 2C 30 2C 32 2C 30 ."571143BT 2C 22 35 37 31 31 34 33 30 54 PRINT 1 22 0D 0A 50 52 49 4E 54 20 31 .1 2C 31 0D 0A </pre>	Hex decimal data related to left column of ASCII data
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Fig. 4 Dump mode printout

The characters on the left hand side are received from your system and the data on the right hand side is the corresponding hexadecimal value of the characters. It allows users or engineers to verify and debug the programme. You just simply turn the power switch off and on to reset the printer for normal printing.

3.5 Initialisation

Printer initialisation is used to clear DRAM and restore the printer settings to defaults, which do not include the ribbon setting. It is activated by the following procedures.

1. Turn off the printer power.
2. Press the button and then turn on the power. The LED will become red, orange and blink 5 times (for around 5 seconds) then become green and blink 5 times.
3. Release the button when the LED becomes green and starts blinking and then the printer will be reset (the LED becomes orange then solid green).

The LED colour will be changed in accordance with the following pattern:

Orange → red (5 blinks) → orange (5 blinks) → **green (5 blinks)** → green

4. The printer configuration will be set as below after the initialisation

Parameter	Default setting
Speed	K4452, 127 mm/sec (5 ips) K4453, 76 mm/sec (3 ips)
Density	7
Label Width	4.25" (108.0 mm)
Label Height	2.5" (63.4 mm)
Sensor Type	Gap sensor
Gap Setting	0.12" (3.0 mm)
Print Direction	0
Reference Point	0,0 (upper left corner)
Offset	0
Tear Mode	On
Peel Off Mode	Off
Cutter Mode	Off
Serial Port Settings	9600 bps, none parity, 8 data bits, 1 stop bit
Code Page	850
Country Code	001
Clear Flash Memory	No

4. Setup

4.1 Setting Up the Printer

1. Place the printer on a flat, secure surface.
2. Make sure the power switch is off.
3. Connect the printer to the computer with the Centronics or USB cable.
4. Plug the power cord into the power supply connector at the rear of the printer, and then plug the power cord into a properly grounded power point.

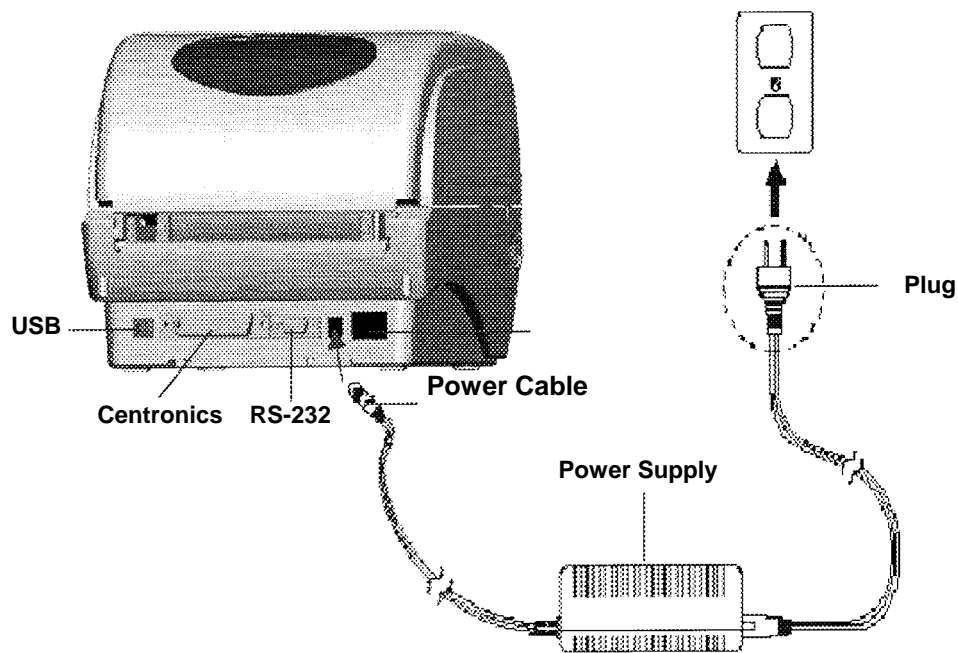


Fig. 5 Attach power supply to printer

4.2 Loading the Ribbon

The printer automatically detects if a ribbon is installed after power on and will switch to thermal transfer or direct thermal printing mode. If the printer does not detect a ribbon (direct thermal mode), the motor that drives the ribbon spindles will be turned off. Make sure both the ribbon access cover and the top cover of the printer are closed when powering on the printer.

1. Push down on the ribbon access cover to unlock and open the cover.
2. Place a paper core on a ribbon rewind spindle.
3. Mount the ribbon rewind paper core on the front hubs.
4. Install a ribbon on the ribbon supply spindle.
5. Mount the ribbon supply spindle on the rear hubs.
6. Attach the ribbon leader to the ribbon rewind paper core.
7. Rotate the ribbon rewind paper core until the ribbon leader is thoroughly, firmly encompassed by the black section of the ribbon.
8. Close the ribbon access cover.

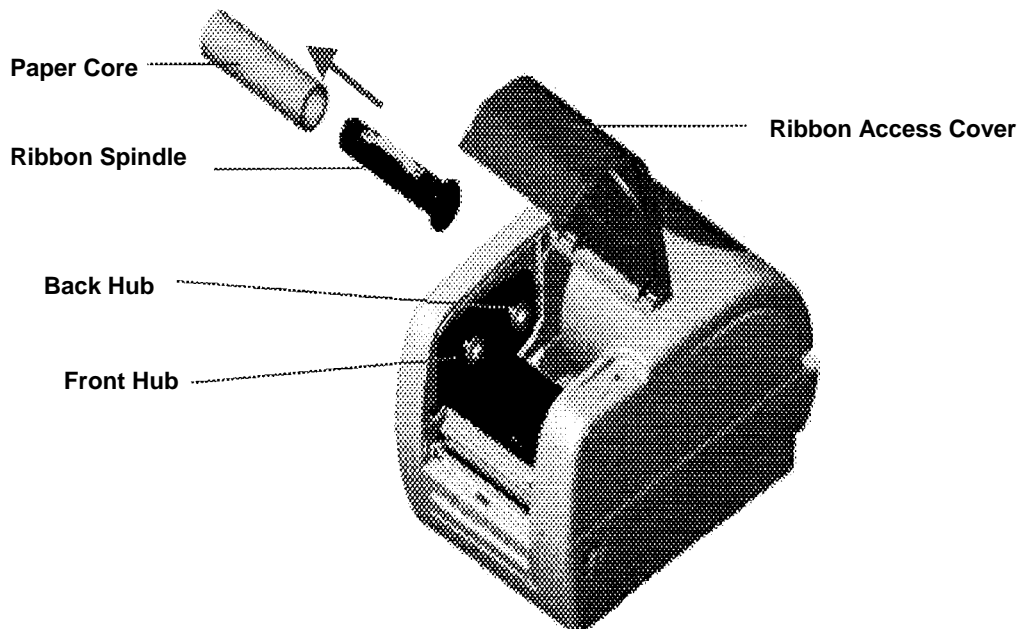


Fig. 6 Ribbon installation (I)

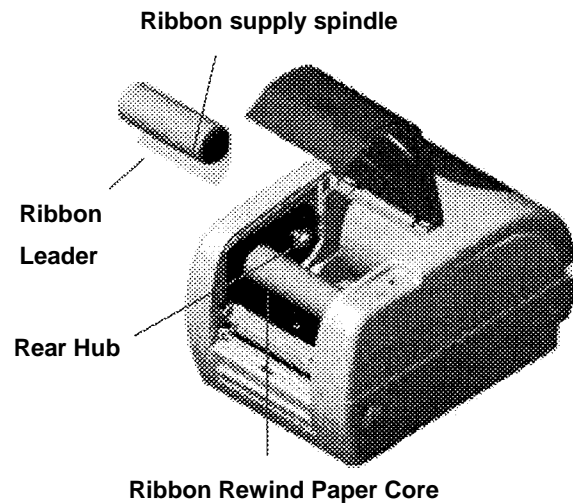


Fig. 7 Ribbon installation (II)

4.3 Loading Label Stock

1. Insert a paper roller into a paper roll (* If your paper core is 1 inch, remove the 1.5 inch paper core adapter from the fixing tab).

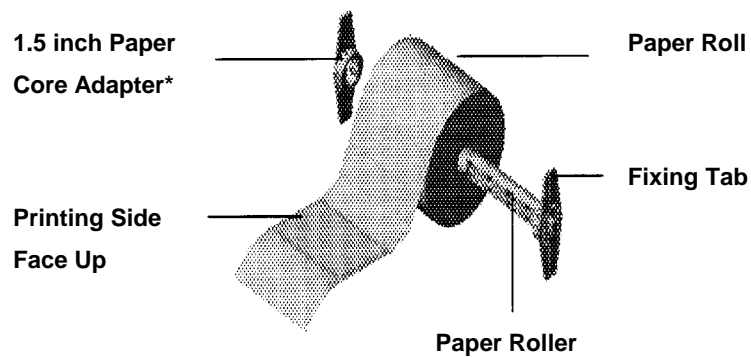


Fig. 8 Label roll installation (I)

2. Open the top cover of the printer by releasing the green cover locking tabs located on each side of the printer and lifting the top cover. A support bar at the rear of the printer will hold the top cover of the printer open.

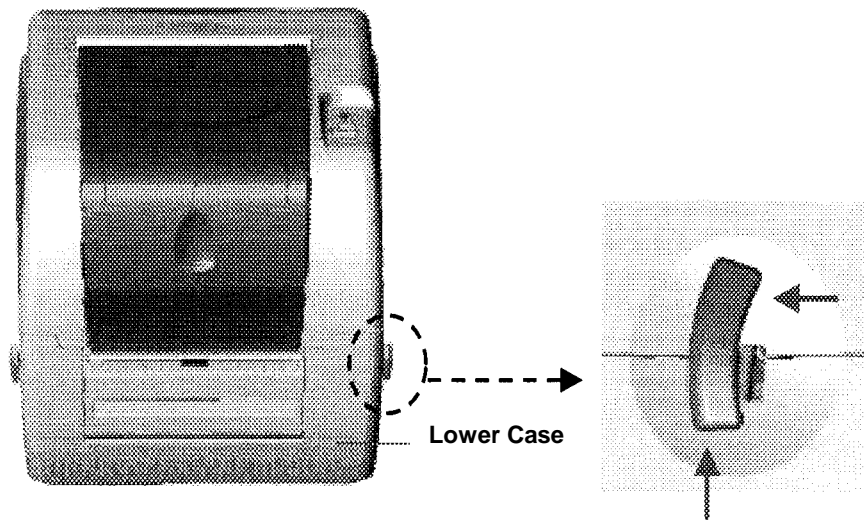


Fig. 9 Pull the lever to open the cover

3. Place a roll of paper on to the centre of the paper roll mount.
4. Feed the paper, printing side face up, through the Teflon bar and the paper guide and pass over the platen.
5. Adjust the green centre-biased paper guides in or out so they are slightly touching the edges of the label backing.
6. To close the top cover of the printer, lift the cover slightly and pull the support bar forward towards the front of the printer. Close the top cover of the printer slowly and make sure the cover locks latch securely.

Note: Failure to securely close and lock the cover will result in a poor print quality.

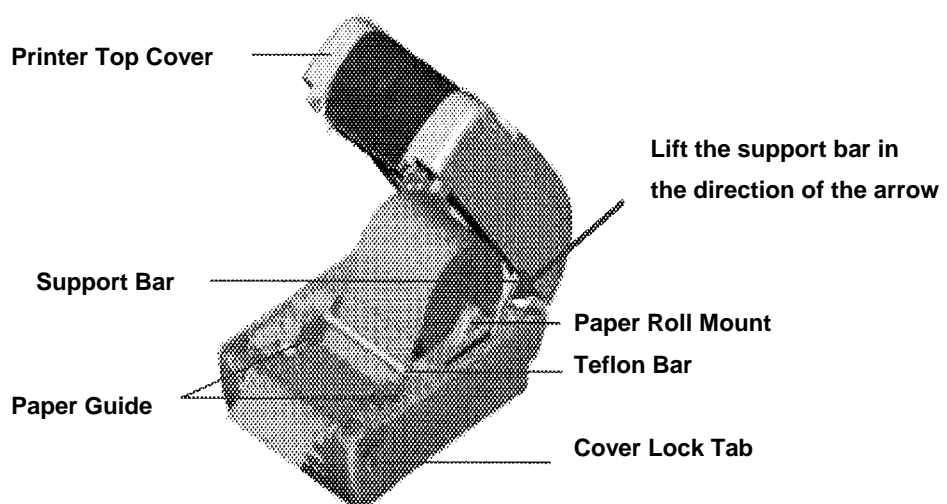


Fig. 10 Label installation (II)

4.4 External Label Roll Mount Installation (Option)

1. Attach an external paper roll mount on to the bottom of the printer.

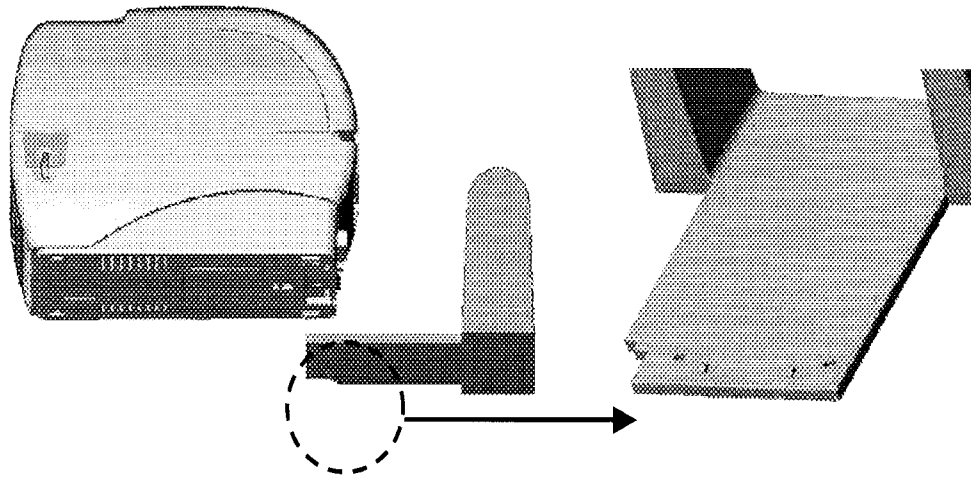


Fig. 11 Attach the external roll mount to the printer

1. Open the top cover of the printer by pushing forward the top cover opening levers. The top cover support will hold the printer top cover.
2. Place a roll of paper on the external paper roll mount.
3. Feed the paper to the external paper feed opening through the rear paper guide.

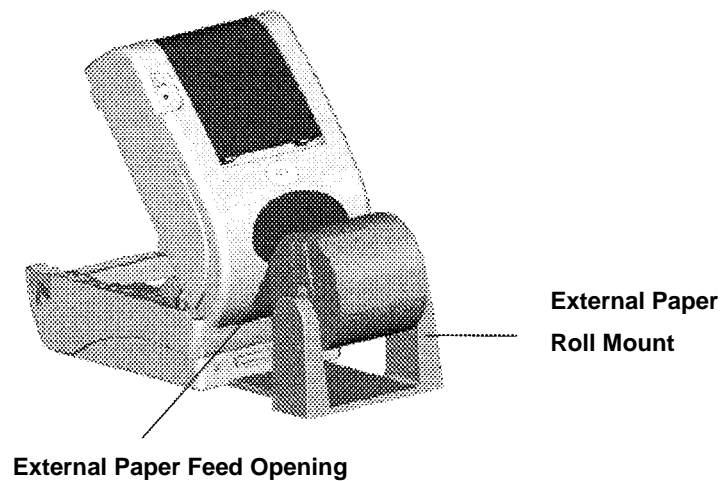


Fig. 12 External roll mount label installation (I)

4. Feed the paper, printing side face up, through the paper guide and pass over the platen.
5. Adjust the paper guide by moving it to the left or right to fit the paper width.

6. Close the top cover of the printer by lifting up the top cover support and slowly close the top cover of the printer.

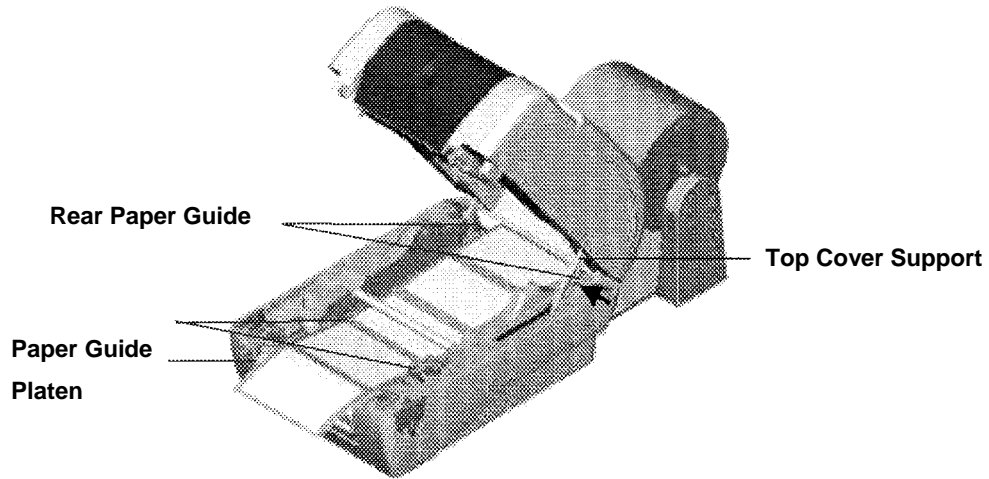


Fig. 13 External roll mount label installation (II)

4.5 Peel-off Module Installation (Option)

1. Open the top cover and remove the front panel from the printer.

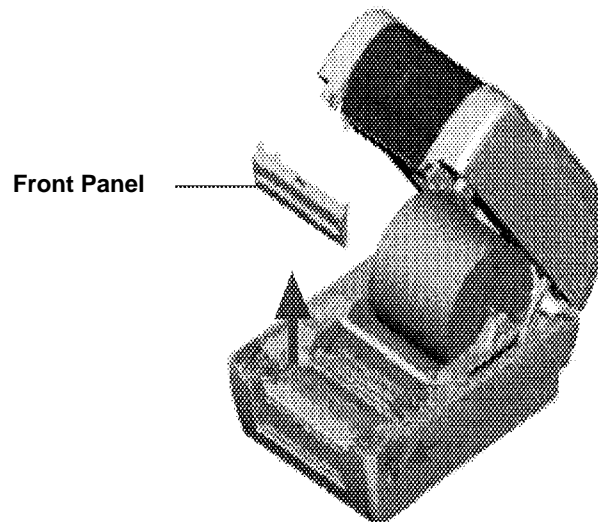


Fig. 14 Removing the front panel

2. Open the top cover and hold it and push the top cover support down and backwards and then push the top cover backwards.
3. Use a screwdriver to unscrew the 6 screws on the lower inner cover.

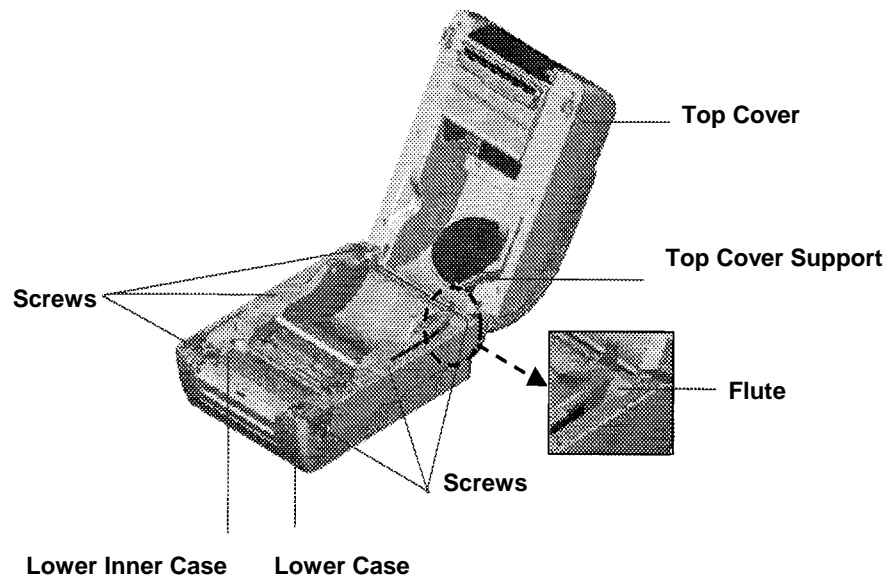


Fig. 15 Removing the 6 screws from lower inner cover

4. Use both thumbs to hold the lower case and index fingers to lift up the top cover opening levers to separate the lower inner case from the lower case.
5. Connect the peeler cable to the 5-pin socket on the printer PCB.

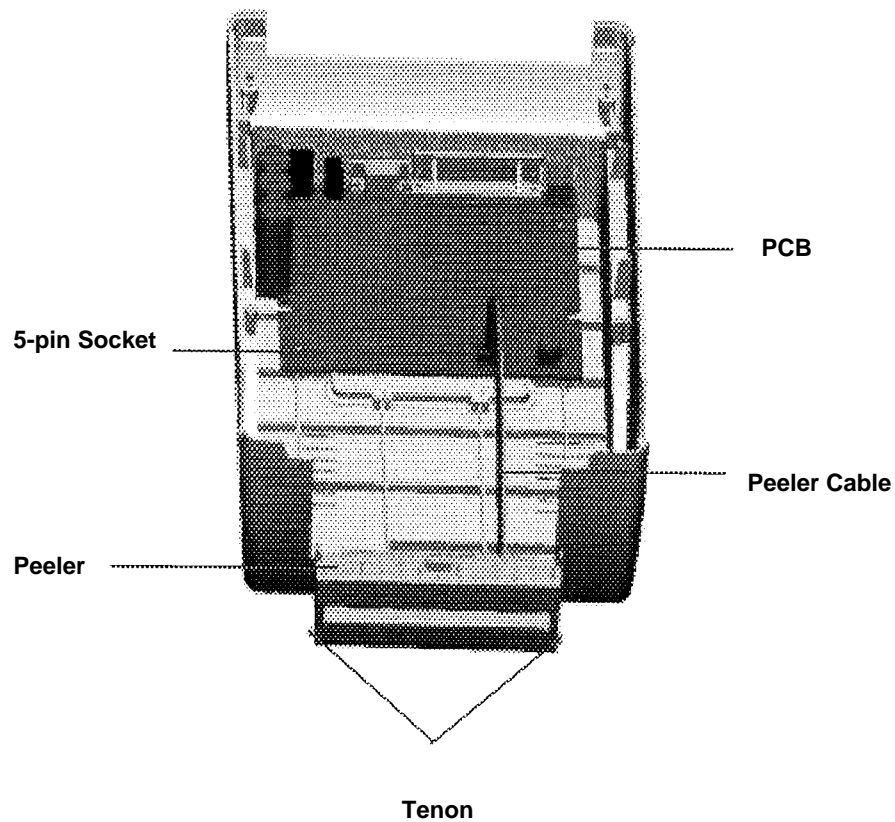


Fig. 16 Connecting the peel-off sensor harness to the main board

6. Arrange the cable through the bezel.

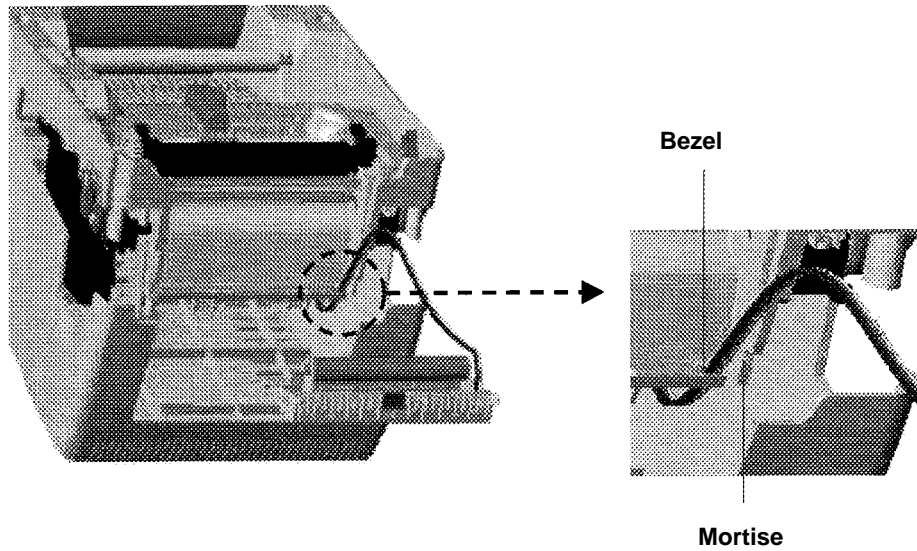


Fig. 17 Peeling off the sensor harness installation

7. Flatten a peeler and embed the tenons in the mortises, and you will hear a clicking sound.

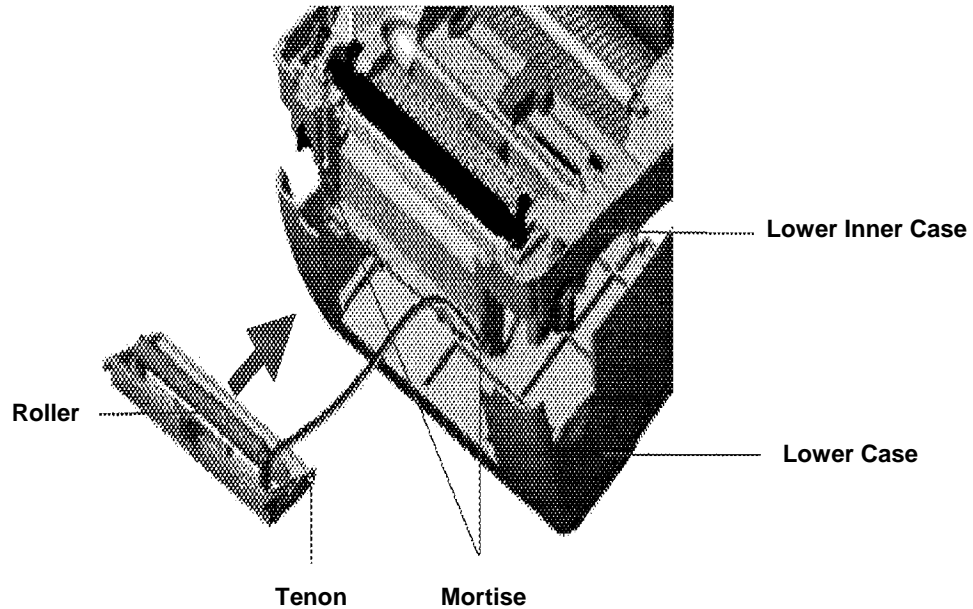


Fig. 18 Peel-off panel installation (I)

8. Put the lower inner cover back into the lower case.

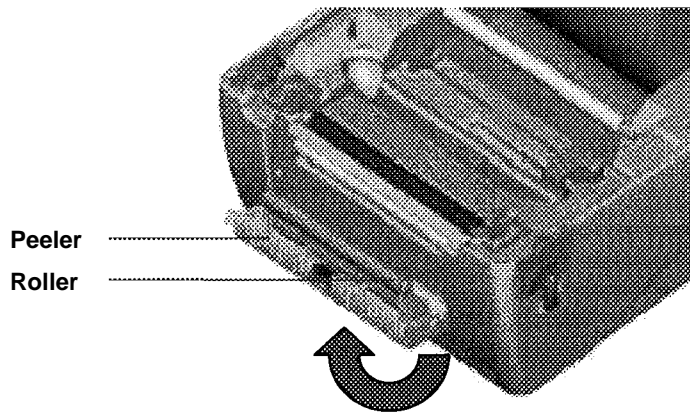


Fig. 19 Peel-off panel installation (II)

9. Lift up the peel-off panel to the lower cover to close it.
10. Use a screwdriver to screw back the 6 screws on the lower inner case.
11. Close the top cover by putting the top cover support back into the flute and push it forwards and then slowly close the top cover.

4.5.1 Loading the Paper for Peel-off Mode

Note: Both thermal paper and plain paper are applicable for the peel-off function but neither PVC nor vinyl work for the peel-off function.

1. Insert a paper roller into a paper roll.
2. Open the top cover of the printer by pushing forward the top cover opening levers. The top cover support will hold the top cover of the printer.

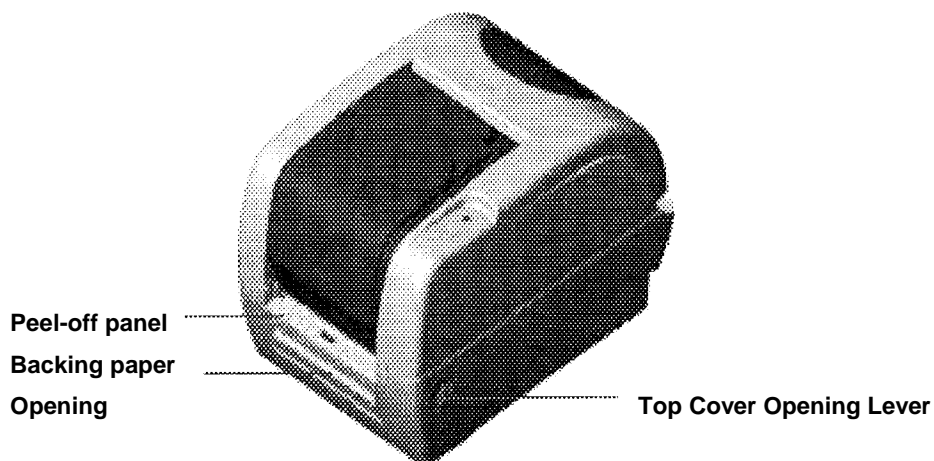


Fig. 20 Opening the top cover

3. Place the paper roll on the paper roll mount.
4. Open the peeler by pulling it out.

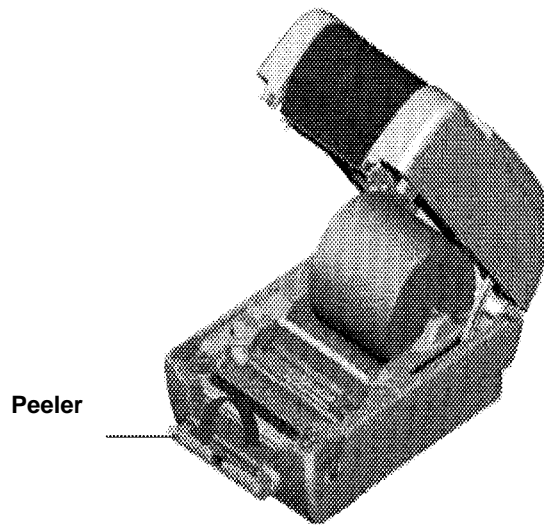


Fig. 21 Opening the peel-off panel

5. Feed the paper, printing side facing up, through the paper guide and pass over the platen.
6. Feed the paper through the backing paper opening, beneath the roller,
7. Adjust the paper guide by moving it to the left or right to fit the paper width.

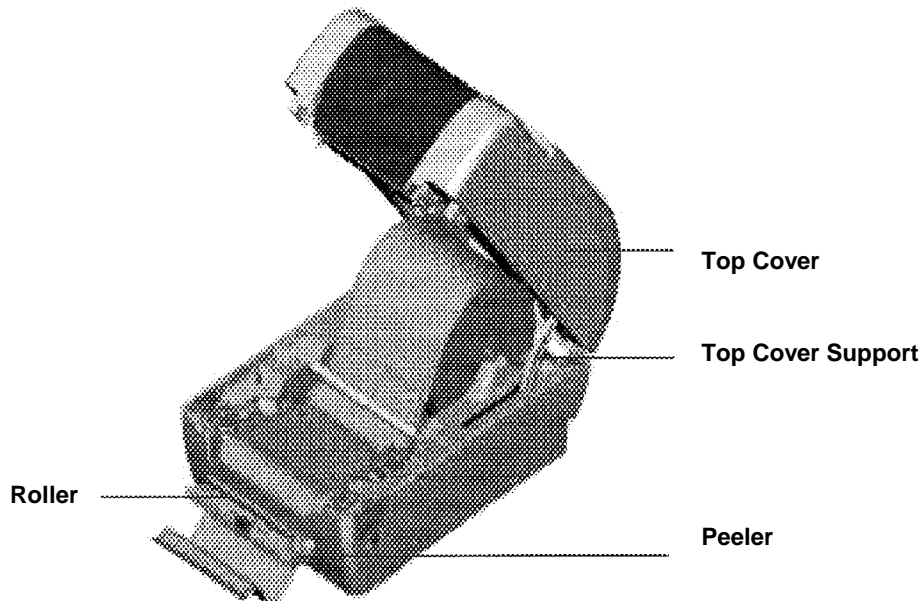


Fig. 22 Feed the paper through the backing paper opening, beneath the roller

8. Push the peeler back into the printer.
9. Close the top cover by lifting up the top cover support and slowly close the top cover.

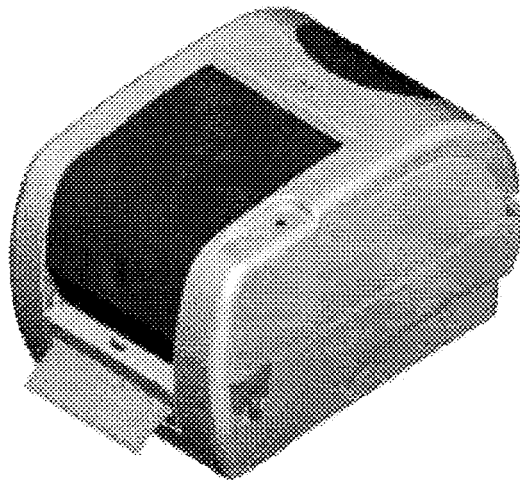


Fig. 23 Complete the label installation for peel-off mode

4.6 Cutter Module Installation (Option)

1. Remove the front panel from the lower cover.
2. Pull the top cover opening levers to open the top cover.

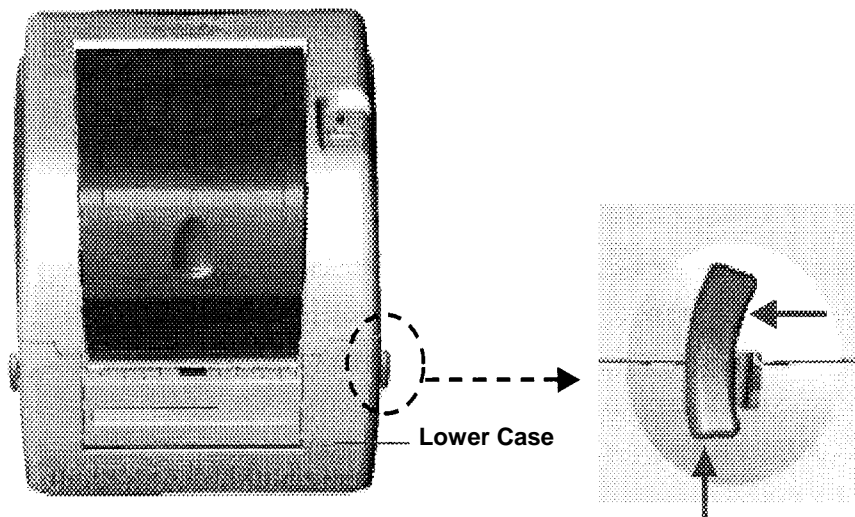


Fig. 24 Pull the lever to open the cover

3. Open the top cover and hold it and push the top cover support down and backwards and then push the top cover backwards.

4. Use a screwdriver to unscrew the 6 screws on the lower inner case.

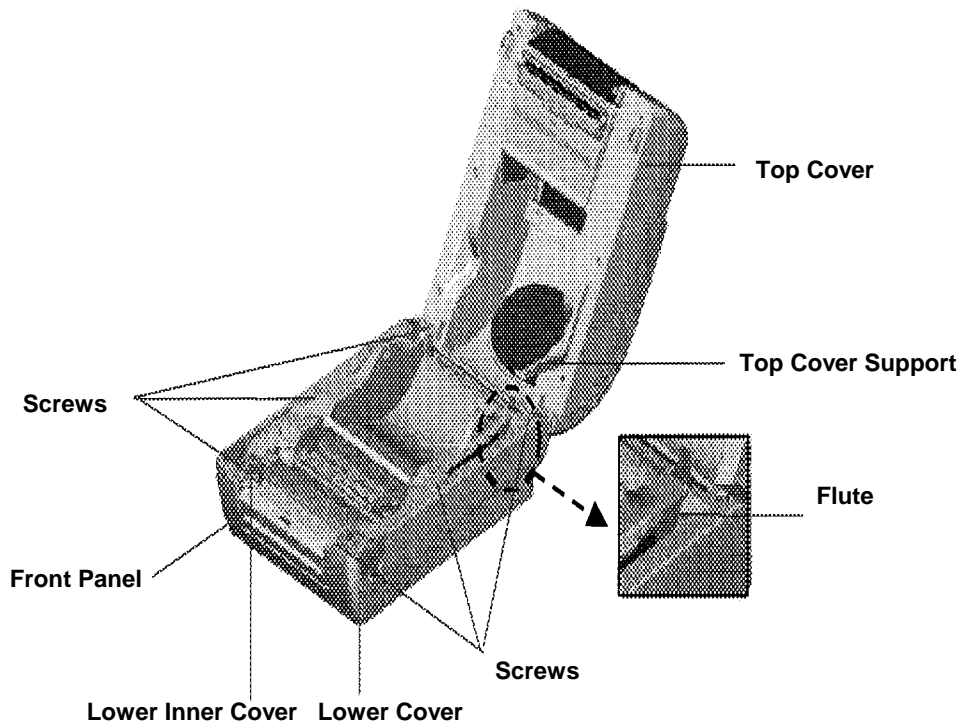


Fig. 25 Removing the 6 screws from the lower inner cover

5. Use both thumbs to hold the lower case and index fingers to lift up the top cover opening levers to separate the lower inner case from the lower case.
6. Connect the cutter module cable to the 4-pin socket on the printer PCB.

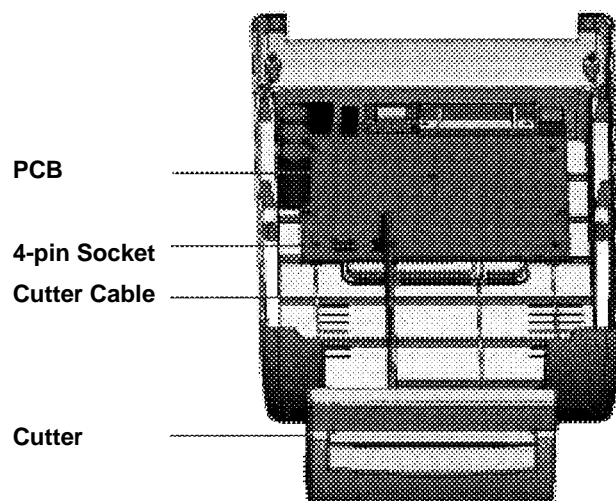


Fig. 26 Cutter module installation

7. Put the cable through the bezel.

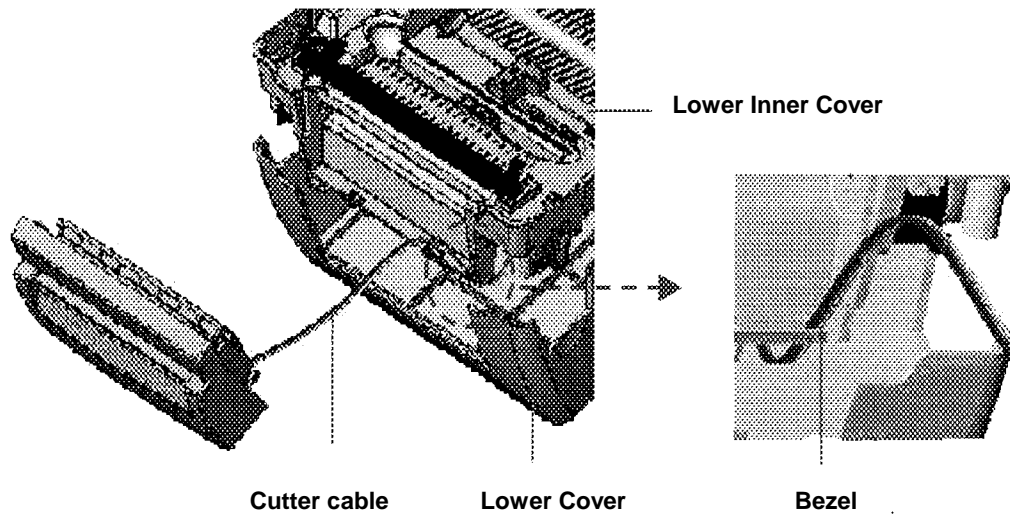


Fig. 27 Cutter module harness arrangement

8. Put the lower inner case back into the lower case.
9. Place the cutter into the niches of the printer.

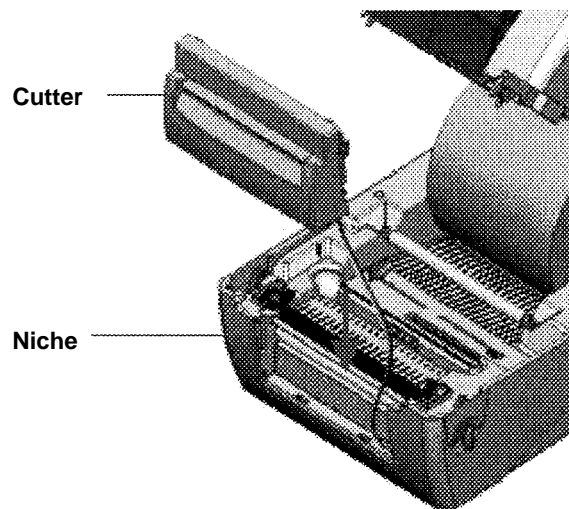


Fig. 28 Cutter module installation

10. Use a screwdriver to screw back the 6 screws on the lower inner case.
11. Close the top cover by putting the top cover support back into the flute and push it forwards and then slowly close the top cover.

4.6.1 Loading the Label in Cutter Mode

1. Insert a paper roller into a paper roll.
2. Open the top of the printer.
3. Place the paper roll on to the paper roll mount.
4. Feed the paper, printing side face up, through the paper guide and pass over the platen
5. Feed the paper through the cutter paper opening.
6. Adjust the paper guide by moving it to the left or right to fit the paper width.

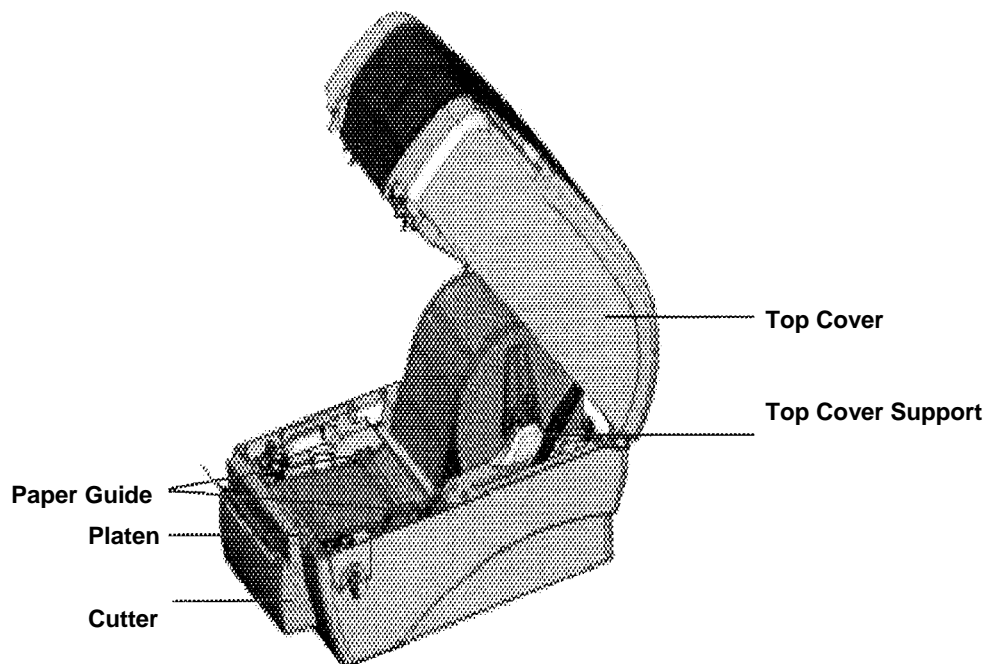


Fig. 29 Label installation in cutter mode

7. Close the top cover by lifting up the top cover support and slowly close the top cover.

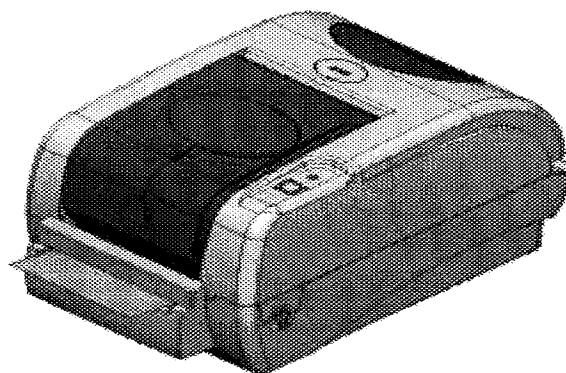


Fig. 30 Complete label installation in cutter mode

5. Maintenance

5.1 Cleaning

Use one or more of the following supplies that meet your needs:

- Cleaning pens
- Cleaning swabs
- Lint-free cloth.

The cleaning process is described as follows

Printer Part	Method
Printer Head	<ul style="list-style-type: none">■ Let the print head cool for one minute.■ Use a cleaning pen to swab the print elements.
Platen Roller	<ul style="list-style-type: none">■ Rotate the platen roller and wipe it thoroughly with 70% alcohol and a cleaning swab, or a lint-free cloth.
Exterior	<ul style="list-style-type: none">■ Wipe it with a water-dampened cloth.
Interior	<ul style="list-style-type: none">■ Brush or air blow.

6. Troubleshooting

This section lists the common problems according to the LED status and other problems that you may encounter when operating the printer. Also, it provides solutions.

6.1 LED Status

LED Status / Colour	Printer Status	Solution Number
Off	Off	1
Solid Green	On	2
Flash Green	Paused	3
Flash Red	Stopped	4

1. **No power.**

- Turn the power switch on.
- Check if the green LED is lit on the power supply. If it is not lit, the power supply is defective.
- Check both power connections from the power cord to the power supply and from the power supply to the printer power jack.

2. **The printer is on and ready to use.**

- No action necessary.

3. **The printer is paused.**

- Press the feed button to resume printing.

4. **The out of labels or ribbons or printer setting is not correct**

Out of labels or ribbons

- Load a roll of labels and follow the instructions in Loading the Paper and then press the feed button to resume printing.
- Load a roll of ribbons and follow the instructions in Loading the Ribbon and then press the feed button to resume printing.

Printer setting is not correct

- Initialise the printer by following the instructions in "Power on Utility".

6.2 Print Quality

Continuous feeding labels

- The printer setting may be wrong. Please do the **Initialisation** and **Gap/Black Mark Calibration**.

No print on the label

- Is the label or ribbon loaded correctly? Follow the instructions in **Loading the Paper** or **Loading the Ribbon**.
- Has the ribbon run out? Follow the instructions in **Loading the Ribbon**.

Poor print quality

- The top cover is not closed properly. Close the top cover completely.
- Clean the thermal print head.
- Adjust the print density setting.
- The ribbon and paper media are not compatible.

7. Specifications

7.1 Printer Specifications

Item	K4452	K4453
Mechanism		
Resolution	203 dpi.	300 dpi
Max. Print Width	108 mm.	106 mm
Max. Print Length	1000 mm (39").	460 mm (16")
Ribbon Capacity	300 metres with 1" core.	(Max. OD 67 mm)
Printing Speed	2, 3, 4 and 5 ips.	2, 3 ips
Peeler function	2, 3 ips	2 ips
Printing Method	Direct thermal and thermal transfer printing.	
Enclosure		
Structure	Double-walled plastic.	
Dimension	Standard Model: 314mm(L) x 213mm(W) x 188mm(H)	
Operation Panel	One push switch, and one indicator LED (Green, Orange, Red colours).	
Hardware		
Sensor	Transmissive sensor (offset 6 mm from liner edge). Reflective sensor (position adjustable). Head open sensor. Ribbon end sensor	
Memory	1M byte Flash memory 2M bytes DRAM	
Interface	RS-232C (max baud rate, 19,200 bps). USB: V1.1. Centronics.	
Power	AC input: 100-240V universal auto switching power supply. DC output: 24V 3.75A.	
Firmware		
Font Type	8 alpha-numeric bitmap fonts, and 1 true type font.	
Rotation	0, 90,180 and 270 degrees.	
Barcode Format	Code 39, Code 93, Code 128UCC, Code128 subsets A.B.C, Codabar, Interleave 2 of 5, EAN-8, EAN-13, EAN-128, UPC-A, UPC-E, EAN and UPC2(5) digits	

Command Set	add-on, MSI, PLESSEY, POSTNET, CPOST, PDF-417, Maxicode, and DataMatrix. TSPL2
Environment	
Operation	Temperature: 5 °C ~ 40 °C. Relative Humidity: 25% ~ 85% (Non Condensing).
Storage	Temperature: -40 °C ~ 60 °C. Relative Humidity: 10% ~ 90% (Non Condensing).

7.2 Label Stock Specifications

Item	Specification
Type	Label (Continuous , Die-cut , Fan-fold).
Wound Type	Outside wound.
Width	50.8mm ~ 112mm (2.0" ~ 4.4").
Length	10mm ~ 1000mm (0.4" ~ 39"). 25.4mm ~ 1000mm (1" ~ 39").(for peeler and cutter)
Thickness	0.06mm ~ 0.19mm.
Roll Diameter	5".
Roll Core Diameter	25.4mm ~ 76.2mm (1" ~ 3").
Gap Height	2mm min.
Black Mark Height	2mm min.
Black Mark Width	8mm min.

7.3 Ribbon Specifications

Item	Specification
Type	Wax, Wax / Resin, Resin.
Core Diameter	1".
Width	Max 110mm.
Capacity	300m with 1" core.
Wound Type	Outside wound.
Ribbon End	Clear or silver end tape.

8. LED and Button Operation

8.1 LED

LED Colour	Description
Green	This illuminates when the power is on and the device is ready to use.
Orange	This illuminates when the system is detecting the paper and ribbon status.
Red	This illuminates if there is a printing error, such as paper empty, ribbon empty, or cover opened etc.

8.2 Button Operation

<p><i>Feed</i></p> <p><i>Pause</i></p> <p><i>Ribbon Sensor Calibration</i></p> <p><i>Gap/Black Mark Sensor Calibration, Label Length Measurement, Self Test and enter Dump Mode</i></p> <p><i>Printer Initialisation</i></p>	<ul style="list-style-type: none"> • Press the button when the LED is green. <ul style="list-style-type: none"> ■ It feeds the label to the beginning of the next label. • Press the feed button during printing <ul style="list-style-type: none"> ■ The printing job is suspended. • Turn off the power switch • Hold down the button, then turn on the power switch. • Release the button when the LED becomes red and starts to blink. (Any red will do during the 5 blinks). <ul style="list-style-type: none"> ■ It will calibrate the ribbon sensor sensitivity. • Turn off the power switch. • Hold down the button, then turn on the power switch. • Release the button when the LED becomes orange and starts to blink). (Any orange will do during the 5 blinks). <ul style="list-style-type: none"> ■ The LED colour will be changed in accordance with the following sequence. Orange → red (5 blinks) → orange (5 blinks) → green (5 blinks) → green. ■ It calibrates the sensor and measures the label length and prints internal settings then enters into dump mode. • Turn off the power switch. • Hold down the button, then turn on the power switch. • Release the button when the LED turns green after 5 orange blinks. (Any green will do during the 5 blinks) <ul style="list-style-type: none"> ■ The LED colour will be changed in accordance with the following sequence: orange → red (5 blinks) → orange (5 blinks) → green (5 blinks) → green. • Always do the gap/black mark sensor calibration after the printer initialisation.
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