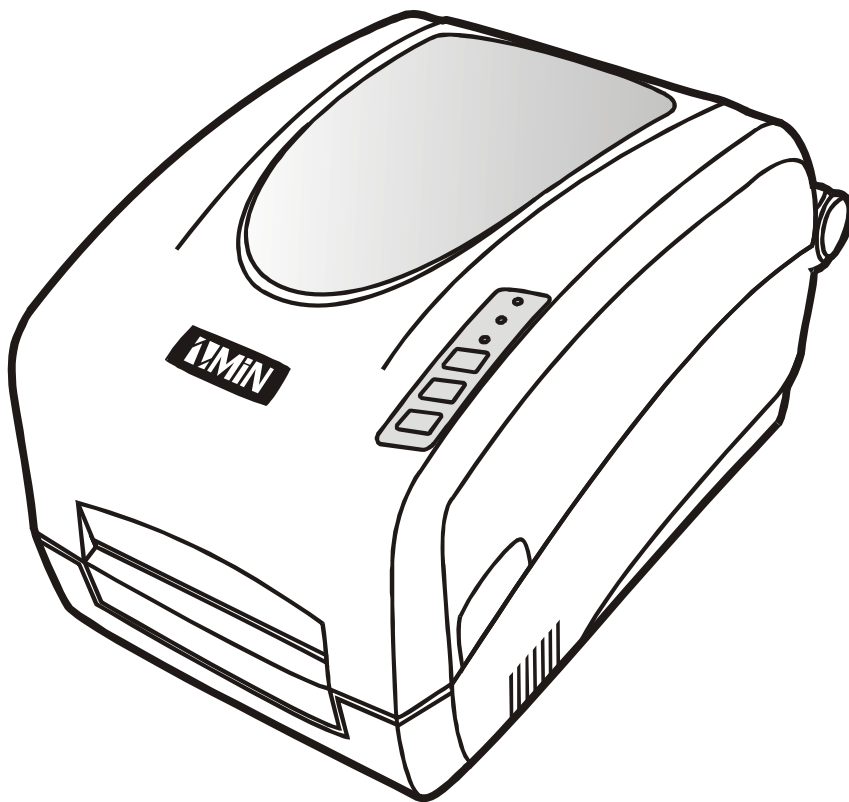


X Series
Label Printer

User's Manual



ZMIN TECHNOLOGIES

2015-4-8 Version 1.5

Part Number: 8010001002

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FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution

Only qualified and trained service technicians should attempt to repair the printer.

To avoid getting an electric shock, do not use a worn or damaged power cord. If the power cord becomes damaged or frayed, replace it immediately.

Be sure that the output of the power adapter is 24VDC and your power source matches the rating listed on the power adapter. Be certain your power source is grounded.

The printer and power adapter should never be operated in a location where either one can get wet. Personal injury may result.

Don't stress or impact printers, lest damage printer or lead to printer doesn't operate properly.

Place the printer on a flat, firm, solid surface.

Don't insert anything into the ventilation slots or openings on the printer

The printer power should be turned off while not in use.

To get increased printhead longevity and higher quality printouts, always use approved labels, tags and thermal transfer ribbons. Approved supplies can be ordered from your dealer.

The printhead becomes hot while printing. To protect from damaging the printhead and risk of personal injury, avoid touching the printhead.

The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this printer. You must observe static-safe procedures when working with the printhead or the electronic components under the top cover.

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Preface

Thank you for choosing ZMIN X series printer. ZMIN Technologies Will offer you high quality products and services.

This manual contains information on how to set up and operate your X series printer. It also provides detailed information on configuration and maintenance procedures that can be performed by the operator.

Please read this manual carefully before using the X series printer.

Important Notice

Thermal printhead can be easily damaged due to its precision construction. A printhead damaged by misuse is not covered under the terms of the warranty. To ensure longevity of the printhead, please note the following:

1. DO NOT scrape or use tools that might damage the printhead surface.
2. To protect from corroding the printhead, DO NOT touch the printhead with bare hands.
3. Keep printhead from any form of liquid or dampness.
4. Use a Cotton Swab dipped in absolute alcohol to clean the printhead only.
5. Always use high-quality consumables:
 - (1) When the printhead module is closed, pressure is placed directly onto the printhead; dirt such as paper scraps, sand, dust and glue can scrape or damage the printhead.
 - (2) The printhead is also easily damaged by thermal paper or thermal transfer ribbon, which contains Na, K or Cl.

So, always inspect consumables for quality before purchasing.

Chapter 1 Introduction

Specifications

Specifications for Printer

Model	X1	X1i
Printing method	Direct thermal & Thermal transfer	
Resolution	203 DPI (8 dots/mm)	300 DPI (11.8 dots/mm)
Maximum print speed	6 IPS(152.4 mm/s)	4 IPS(101.6 mm/s)
Maximum print width	4.09"(104 mm)	4.15" (105.6 mm)
Maximum print length	157.5" (4000mm)	78.7" (2000mm)
Memory	2 MB FLASH ROM, 8 MB SDRAM	
Media	Roll-feed, die-cut, continuous, fan-fold, tags, tickets in plain paper or thermal paper Width: 4.5" (114 mm) max., 0.8" (20 mm) min. Supply roll: OD 5"(127 mm) max., ID 1"(25.4 mm) min. Thickness: 0.08~0.20mm(0.003"~0.0078"), including liner	
Ribbon	Wax, Wax/Resin, Resin Ribbon roll: OD 2.75"(70 mm) max. with ID 1"(25.4 mm) core or ID 0.5"(12.7 mm) core Max width: 110 mm; Max length: 300 M	
Media sensor	Adjustable reflective & Transmissive	
Bar Code Types	1D Barcode : Code 39, Code 93, Code 128, Codabar, EAN-8/13/128, Interleave 2 of 5, UCC-128, UPC A/E 2 and 5 add-on, etc. 2D Barcode : Data Matrix, MaxiCode, PDF417, QR, etc.	
Interfaces	RS-232 serial, USB	
Power rating*	24 VDC, 2.5 A	
Weight	2.62 KGS	
Dimensions	W208 x D310 x H195 mm	
Operation environment	Temperature: 32° F ~ +104° F (0° C ~ 40° C) Relative humidity: 5% - 85% non condensing	
Storage environment	Temperature: -40° F ~ +140° F (-40° C ~ 60° C) Relative humidity: 5% - 85% non condensing	
Optional items	Peeler kit, Internal 100/10 M Ethernet Interface card	

Specifications for Power Adapter

Input	AC 100~240 V, 47~63 Hz
Output	DC 24 V, 2.5 A
Environment	0° C ~ 40° C

Unpacking & Inspection

When unpacking the X Series Printer, make sure you save all packing materials.

Inspect the shipping carton(s) for possible shipping damage, if damage is discovered, notify the shipping company to report the nature and extent of the damage.

Please check the items according to the Packing List. If there are any items missing, notify your authorized reseller.

Packing List (see Figure 1) :

- | | |
|--------------------------|-------|
| 1. Printer..... | 1 pcs |
| 2. Power Adapter..... | 1 pcs |
| 3. Ribbon Spindle..... | 2 pcs |
| 4. Media Spindle..... | 1 pcs |
| 5. Media Roll Guide..... | 2 pcs |
| 6. CD Rom..... | 1 pcs |

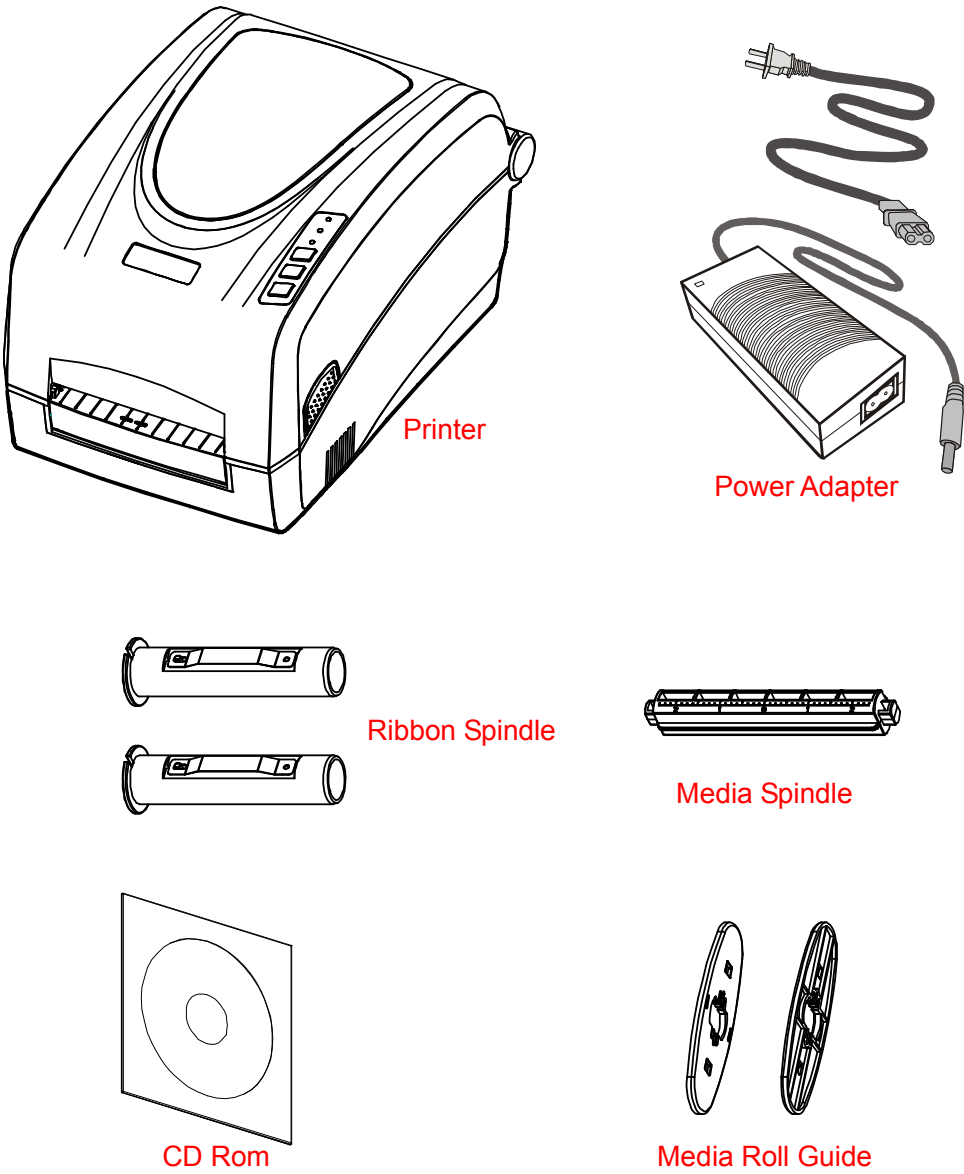


Figure 1: Printer and accessories

Chapter 2 Installation & Operation

Setting up

Before setting up the printer you should consider the following:

1. Make sure there is adequate space around the printer for loading consumables and proper ventilation.
2. Make sure the printer is close to the host so the interface cable is easily accessible at either end.

Parts and Features

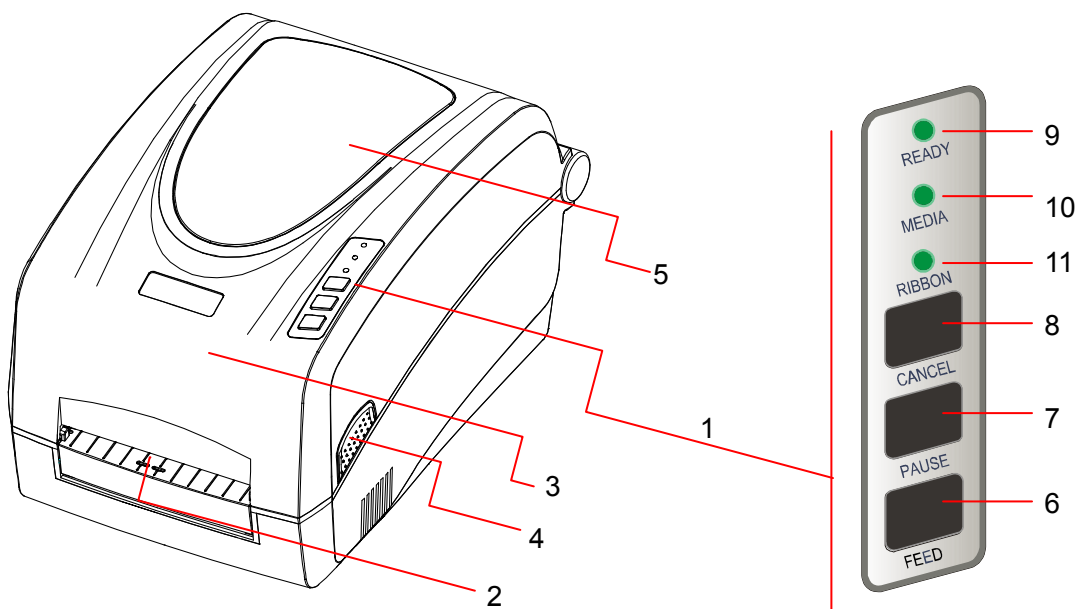


Figure 2

- | | | |
|-----------------------------|----------------------------|--------------------------|
| 1. Front Panel | 2. Media Exit | 3. Top Cover |
| 4. Top Cover's Latch Button | 5. Consumables View Window | 6. FEED Key |
| 7. PAUSE Key | 8. CANCEL Key | 9. READY Indicator Light |
| 10. MEDIA Indicator Light | 11. RIBBON Indicator Light | |

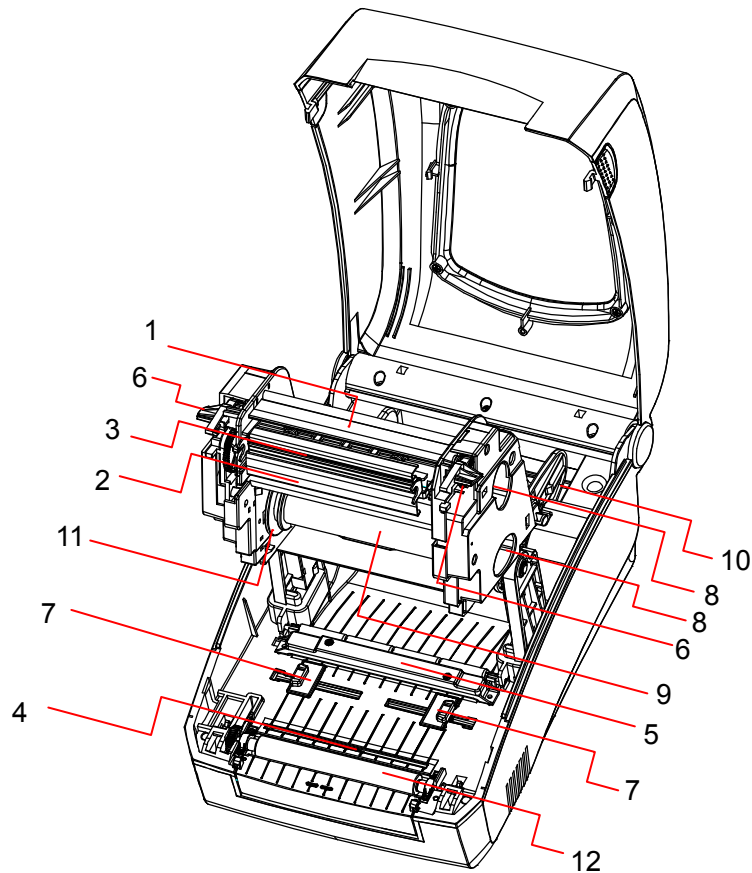


Figure 3

- | | | |
|----------------------------|------------------------------|------------------------------|
| 1. Printhead Module | 2. Printhead Holder | 3. Printhead |
| 4. Reflective Media Sensor | 5. Transmissive Media Sensor | 6. Printhead Latch Levers |
| 7. Media Guide | 8. Ribbon release lever | 9. Ribbon Supply Compartment |
| 10. Media Compartment | 11. Ribbon Supply Wheel | 12. Platen Roller |

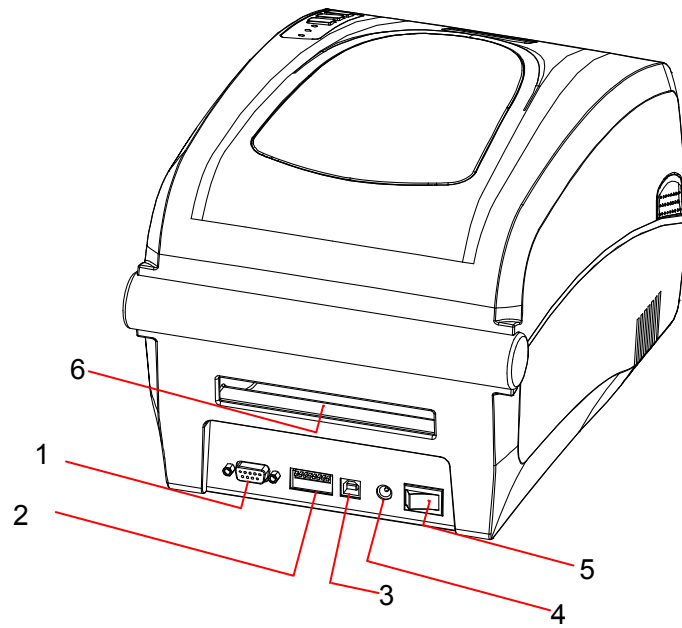


Figure 4

1. RS232 Serial Interface
4. DC Jack

2. DIP Switches
5. Power Switch

3. USB Interface
6. Rear Media Supply Window

Connecting the printer

Attaching Power

Caution:

- (1) Use of the wrong power adapter could damage your printer. ZMIN Technologies assumes no liability for any damage in such case. The rating for the printer is 24VDC.**
- (2) Make sure the AC voltage which you using is accorded with power adapter requirements.**
- (3) Never operate the printer and power adapter in an area where they can get wet. Serious personal injury could result!**

1. Make sure the printer's power switch is in the OFF position.
2. Insert the AC power cord into the power adapter.
3. Insert the power adapter's DC output plug into the DC Jack on the rear of the printer.
4. Plug the other end of the AC power cord into an appropriate AC electrical outlet.

Interface Connection

Notice:

Make sure the printer's power switch is in the OFF position before connecting the interface cable.

The X Series printers support a variety of interface options and configurations. These include: USB interface, RS232 Serial.

1. Any interface can transmit data from the host. Preliminary communications settings are not required since the printer will automatically detect which interface is active.
2. The default values of printer interface can be obtained from the self-test report. (See Chapter 2 Operation Basics – Advanced Functions - Self Test)
3. Cable configurations for serial (RS-232C) are shown in Appendix A of this guide.
4. Please take the following measures to reduce cable noise.
 - (1) Reduce the length of the data cable (keep the cable length under 1.83 meters / 6 feet) if required.
 - (2) Keep the data cable separate from power cords.

Consumables installation

The Direct Thermal print method or Thermal Transfer print method can be used in the X Series printer.

The Ribbon and Media should be load into the printer while the Thermal Transfer print method is configured.

Only Media should be load while the printer is configured to the Direct Thermal print method.

You must use the correct media for the type of printing you require.

The route of loading the Ribbon and media as showed in Figure 5.

Please see “Loading the Ribbon” and “Loading the Media” for a complete description of the operating procedures.

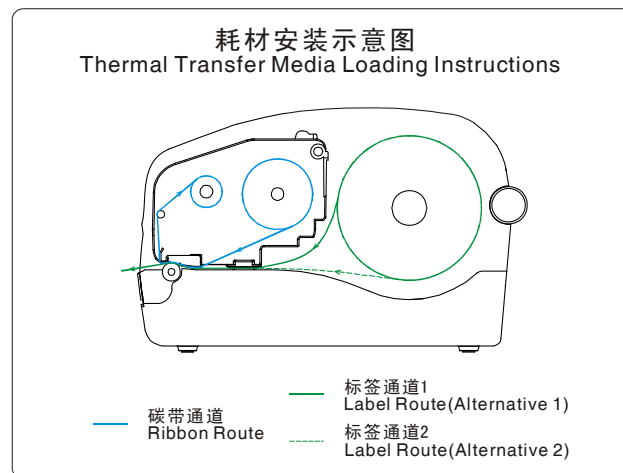


Figure 5

Loading the Ribbon

Notice:

- (1) Make sure the ink side of your ribbon faces outwards. Always make sure the ink side of the ribbon faces the media and NOT the printhead.**
- (2) The maximum width of the ribbon is 110mm. When using a ribbon roll with a width less than 110m, please place the ribbon roll in the middle of the Ribbon Spindle corresponding to the scale.**
- (3) This section is not applicable to direct thermal printing.**

1. Push the left and right Top Cover's Latch Button to lift the top cover. (see Figure 5-1)
2. Pull the left and right Printhead Latch levers to release the Printhead Module.
3. Lift the Printhead Module to expose the Ribbon Supply Compartment. (see Figure 5-2)
4. Unwrap the ribbon roll pack and separate the ribbon roll and the core. (see Figure 5-3)
5. Slide the roll of Ribbon onto one of one Ribbon Spindle. (see Figure 5-3)
6. Load the Ribbon Spindle into the printer and route the ribbon through the Printhead Module. (see Figure 5-4)
7. Slide the ribbon take up core onto the other Ribbon Spindle. (see Figure 5-3)
8. Wrap the end of the ribbon around the ribbon take up core. (see Figure 5-5)
9. Load the ribbon take up core into the Ribbon rewind Compartment. (see Figure 5-6)
10. Rotate the Ribbon rewind wheel on the left of the core to take up the loose ribbon and tighten the ribbon.
11. Close the Printhead Module and press down until it locks into place.

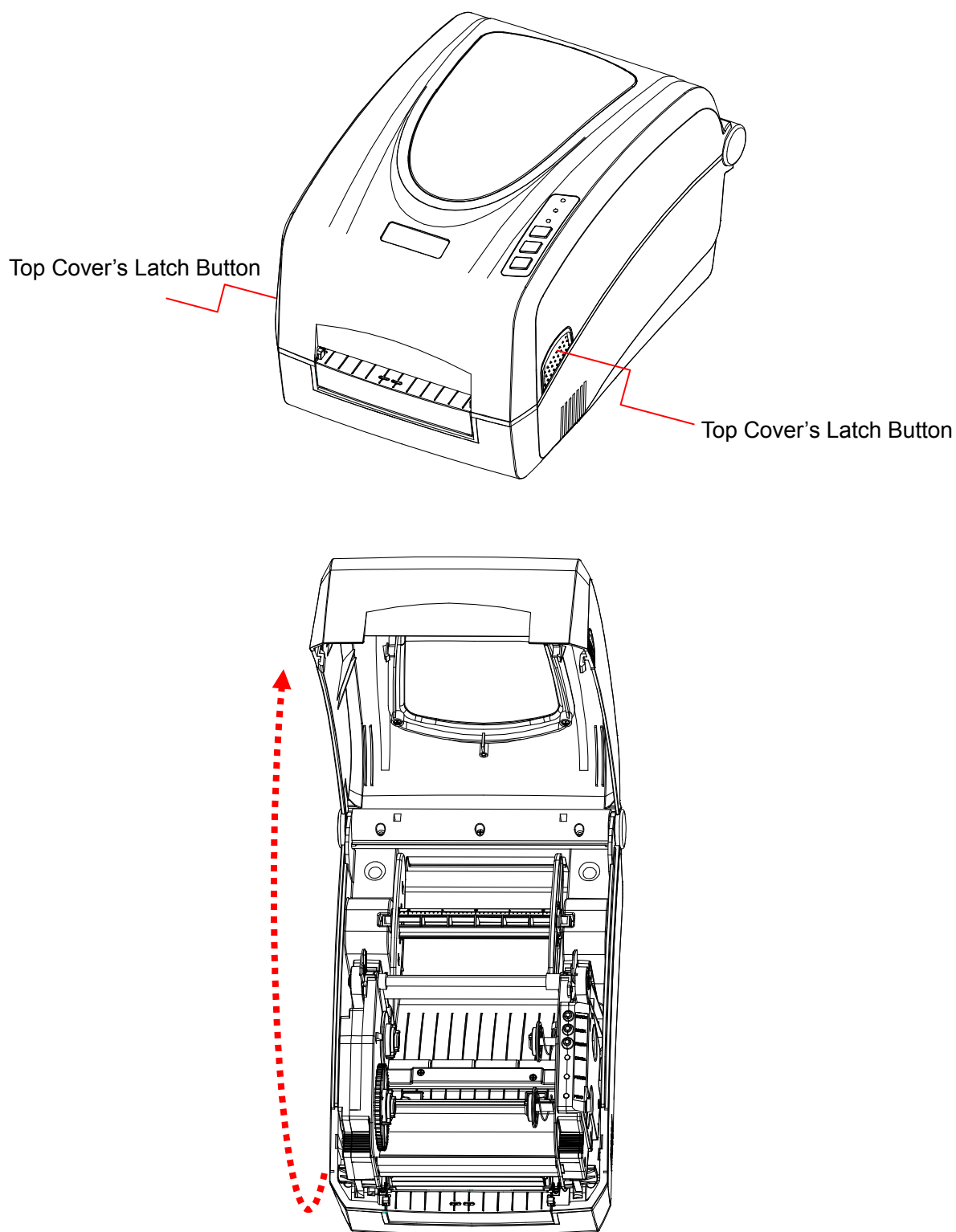


Figure 5-1

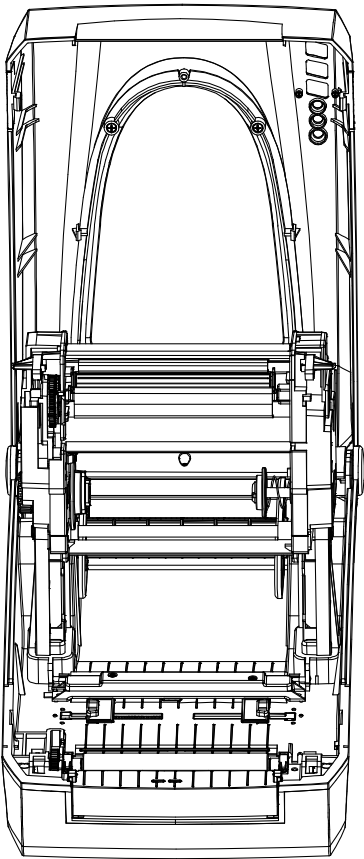
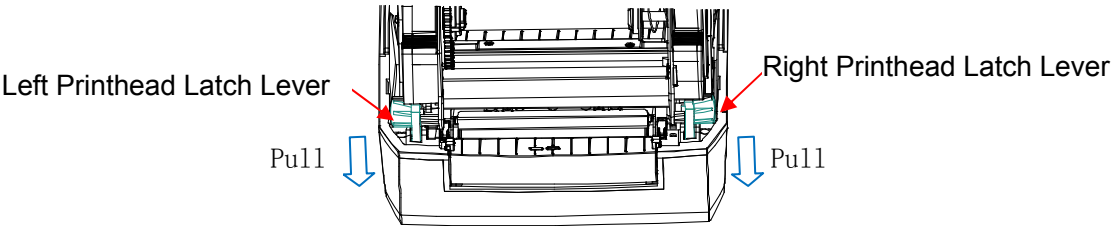


Figure 5-2

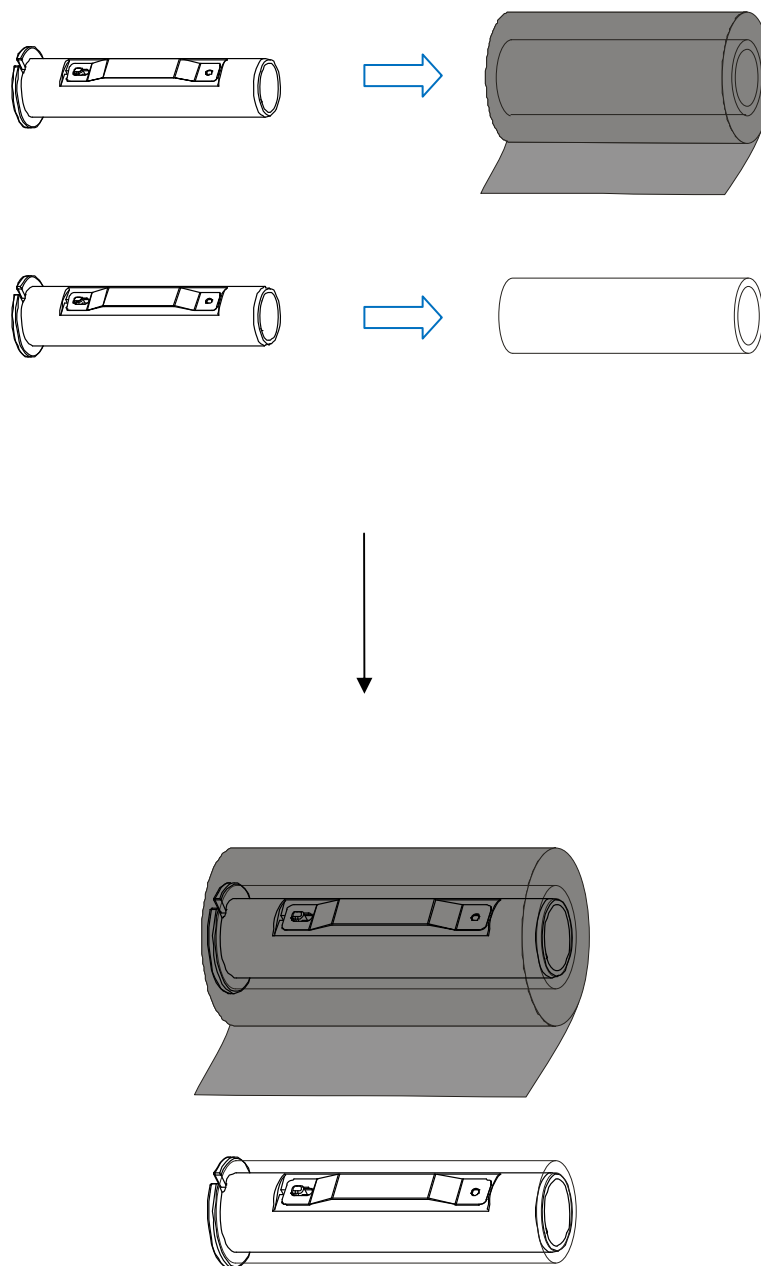


Figure 5-3

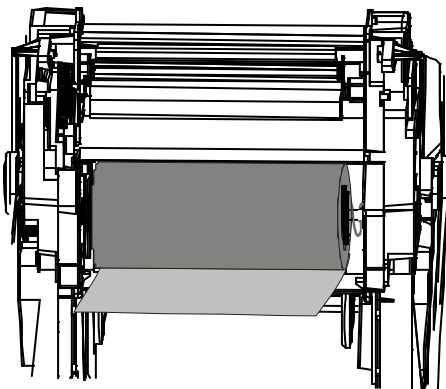
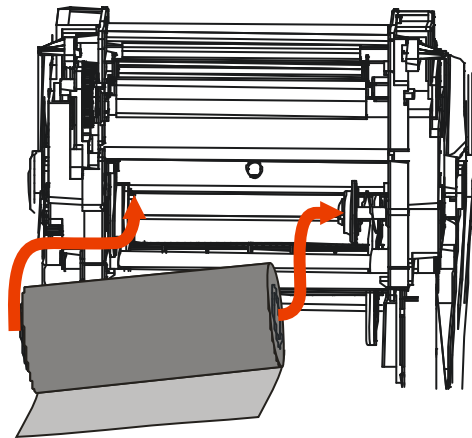
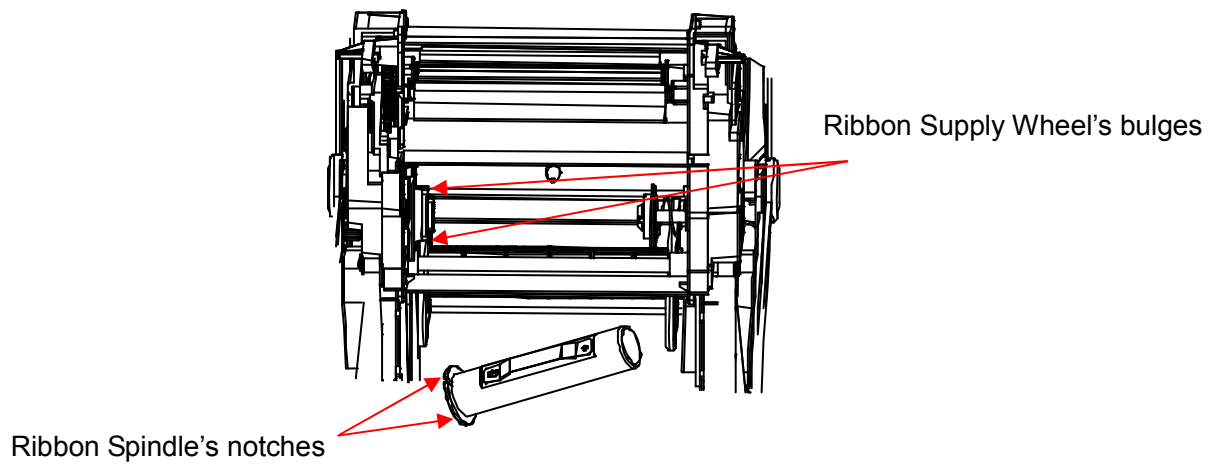


Figure 5-4

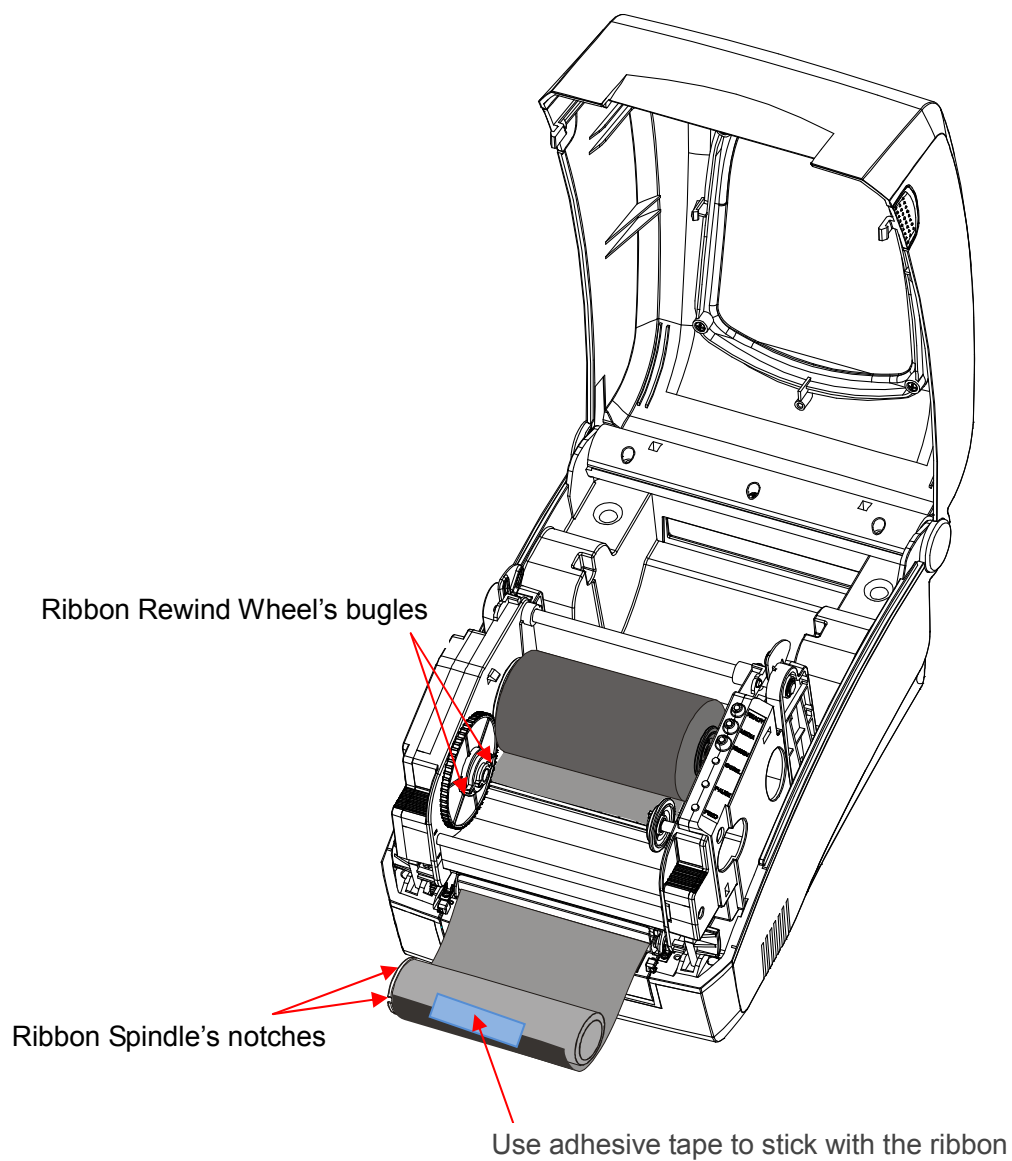


Figure 5-5

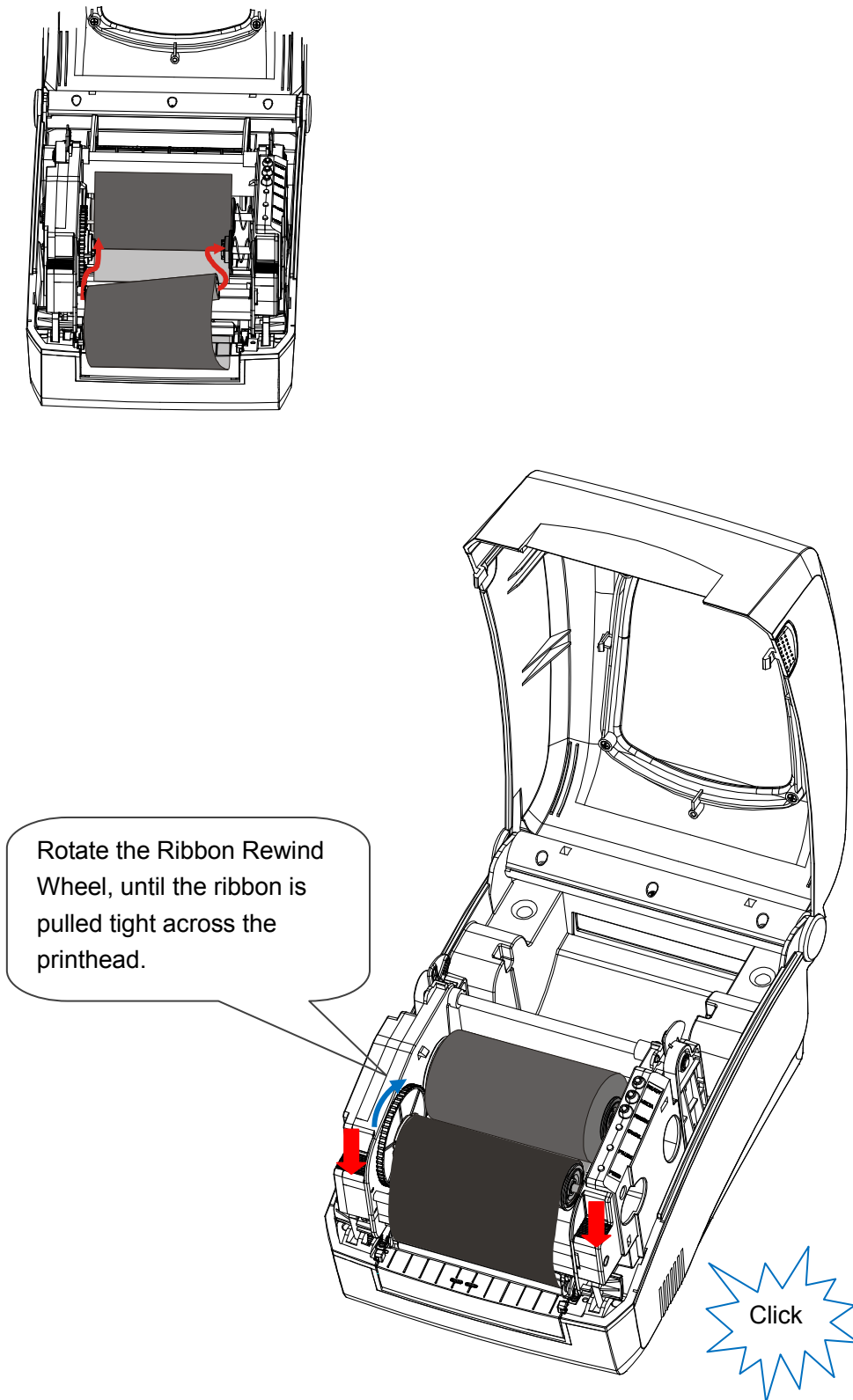


Figure 5-6

Loading the Media

X Series printers can be operated in three different modes: Standard mode, Peel-off mode, or Cutting mode.

In Standard mode, each printed label remains on the backing liner.

In Peel-off mode, each printed label is peeled away from the backing liner automatically.

In Cutting mode, the printer automatically cuts the label after it is printed.

Standard Mode

1. Push the left and right Top Cover's Latch Button to lift the top cover. (see Figure 6-1).
2. Load a roll of media (labels facing up) on the Media Spindle, then slide the two Media Roll Guides with their smooth sides toward the media onto the Media Spindle from each end until snug against the media. If you are placing a roll of media with a 3" ID core, please slide the two Core Adapters onto the Media Spindle first. (see Figure 6-2)
3. Insert them into the Media Compartment.
4. Corresponding to the scale on the Media Spindle, position the media roll in the middle of the Spindle.
5. Release and lift the Printhead Module.
6. Route the media as shown in Figure 6-3.
7. Slide the Media Guide to the edge of the media.
8. Close the Printhead Module and press down until it locks into place (see Figure 6-4).
9. Close the top cover and press the 'Feed' button to feed the media and ensure proper tracking. If the printer does not correctly sense the top of each label, it may be necessary to perform the Calibration Procedure in the Operation Basics section.

Peel-off Mode: The loading guide will be provided with the peeler kit.

Cutting Mode: The loading guide will be provided with the cutter kit.

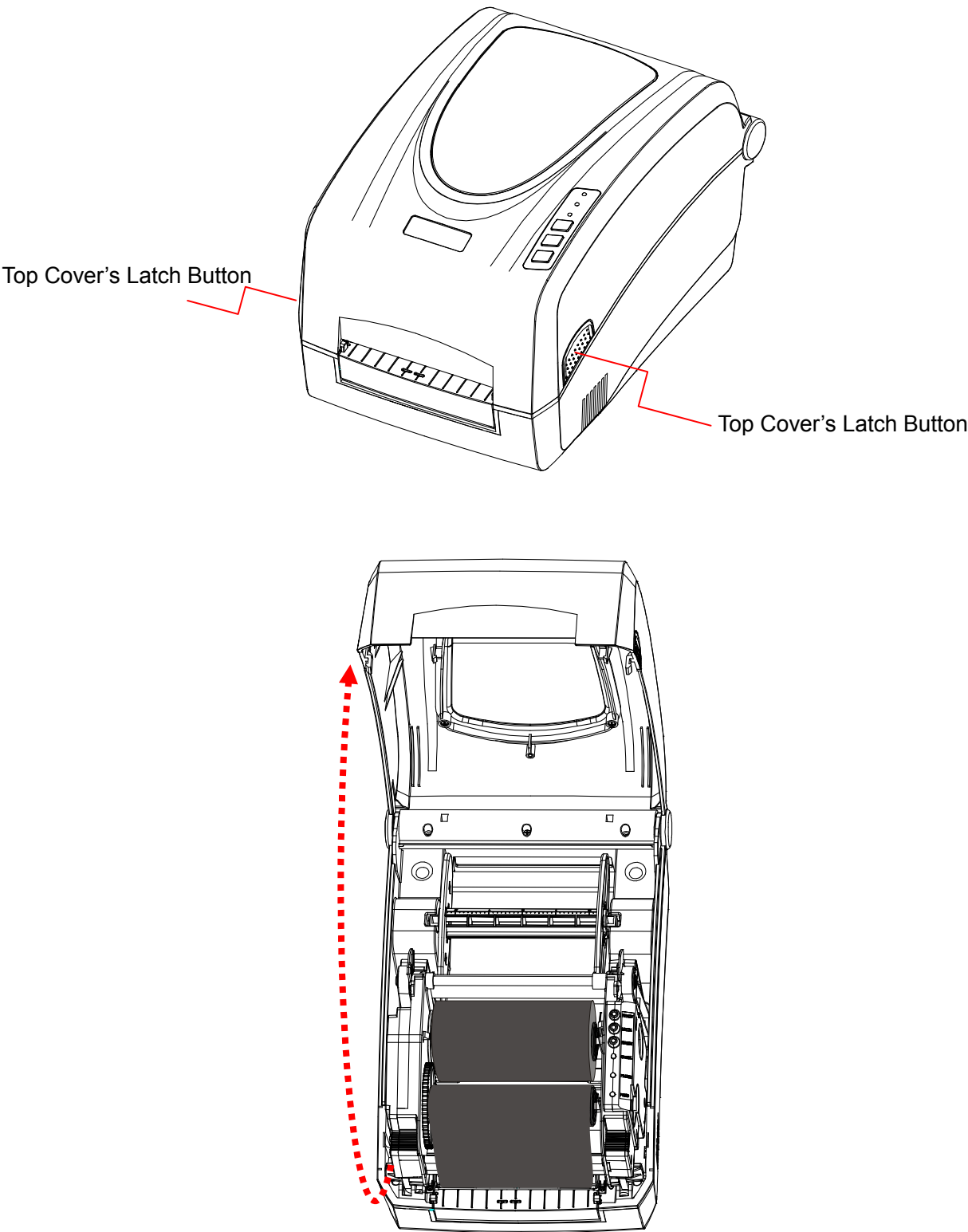


Figure 6-1

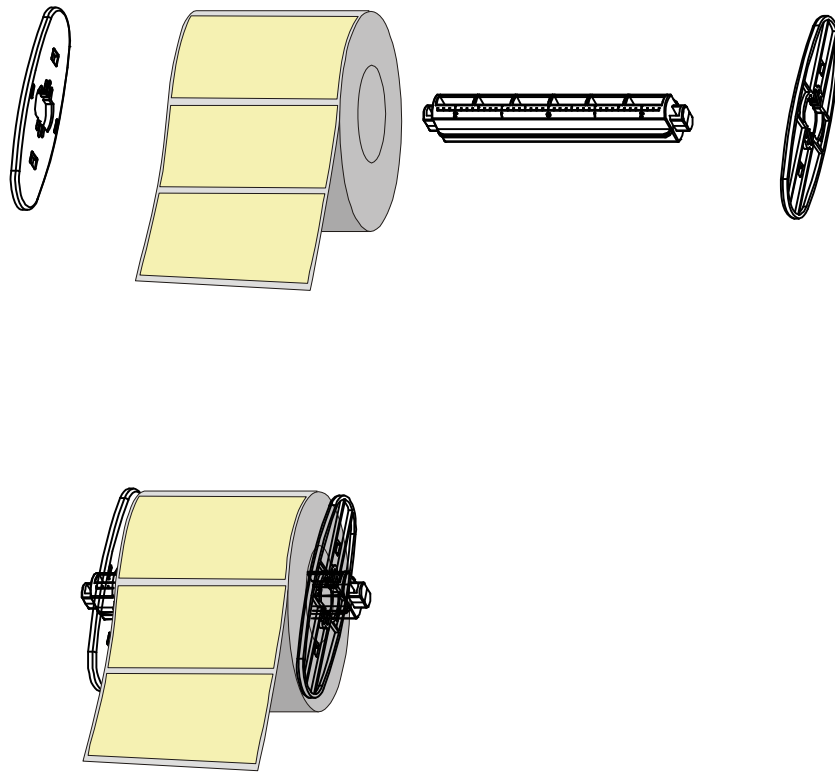


Figure 6-2

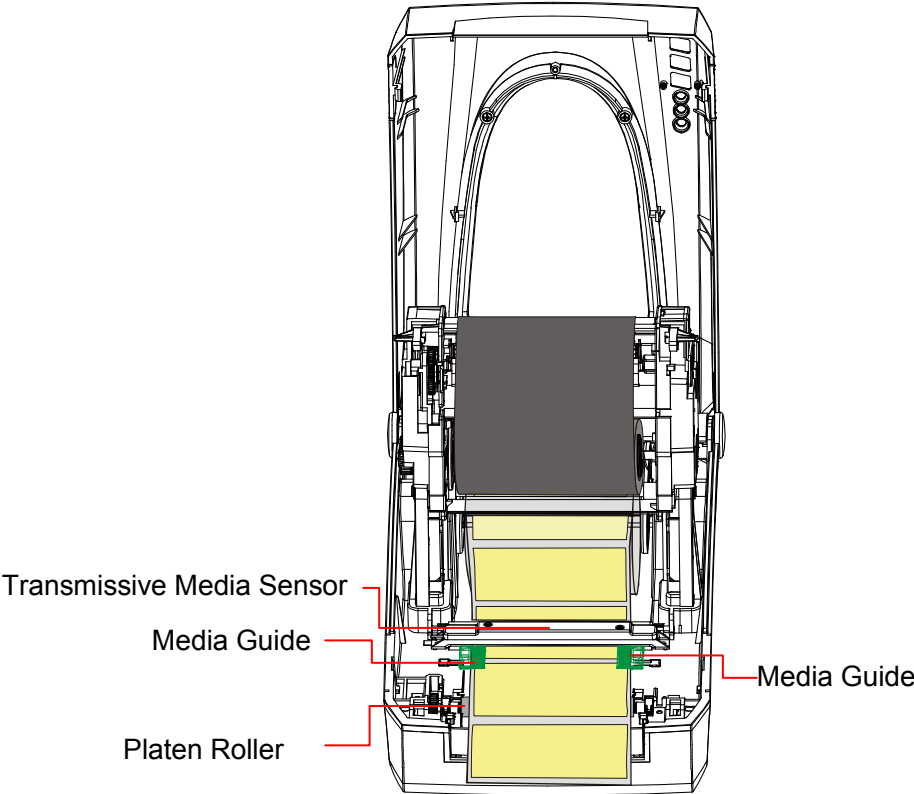


Figure 6-3

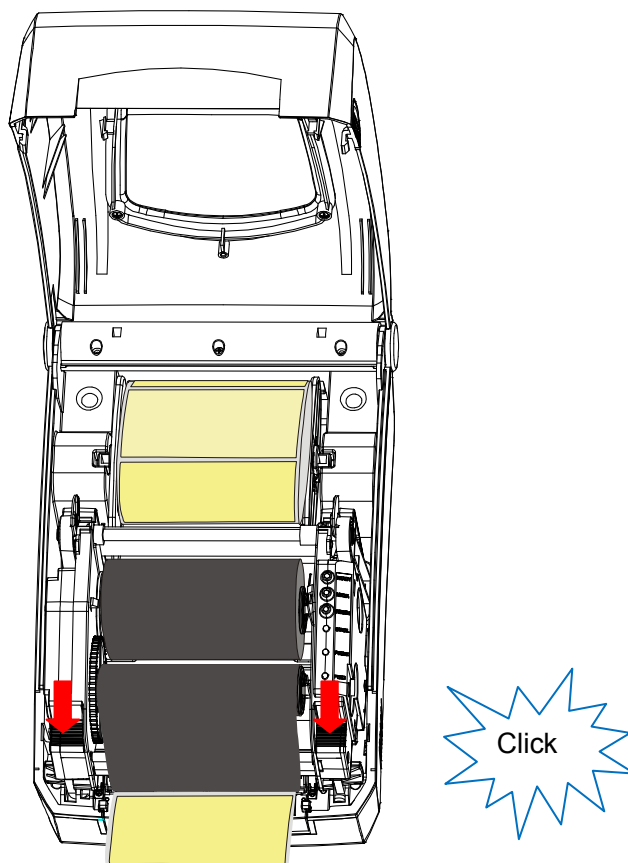


Figure 6-4

Adjusting the Position of Media Sensor

Notice:

Only the Reflective Media Sensor can't be moved, the Transmissive Media Sensor is fixed installed.

1. Push the left and right Top Cover's Latch Button to lift the top cover.
2. Pull the left and right Printhead Latch levers to release the Printhead Module.
3. Lift the Printhead Module to expose the media sensor. (see Figure 7-1)
4. Slide the media sensor to the appropriate position (refer to Figure 7-3, Figure 7-4 and Figure 7-5).

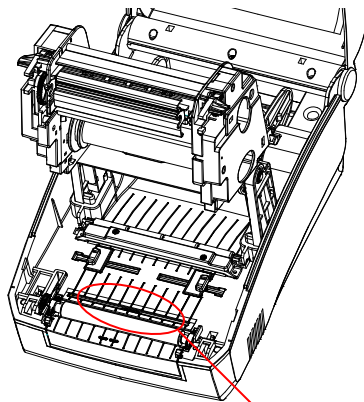
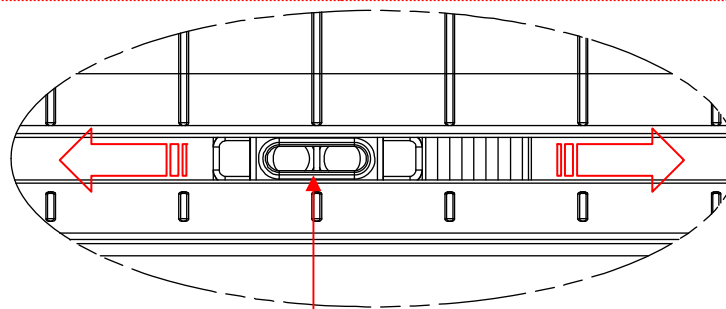


Figure 7-1



Reflective Media Sensor

Figure 7-2

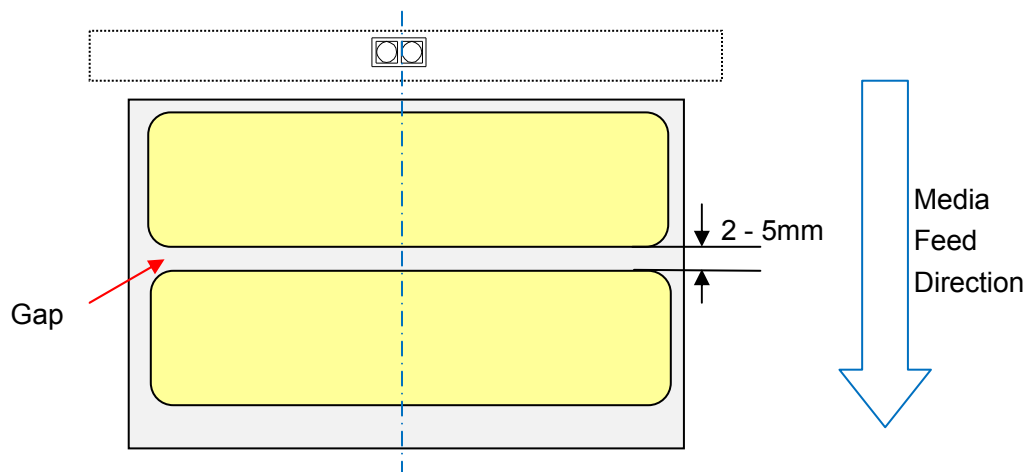


Figure 7-3

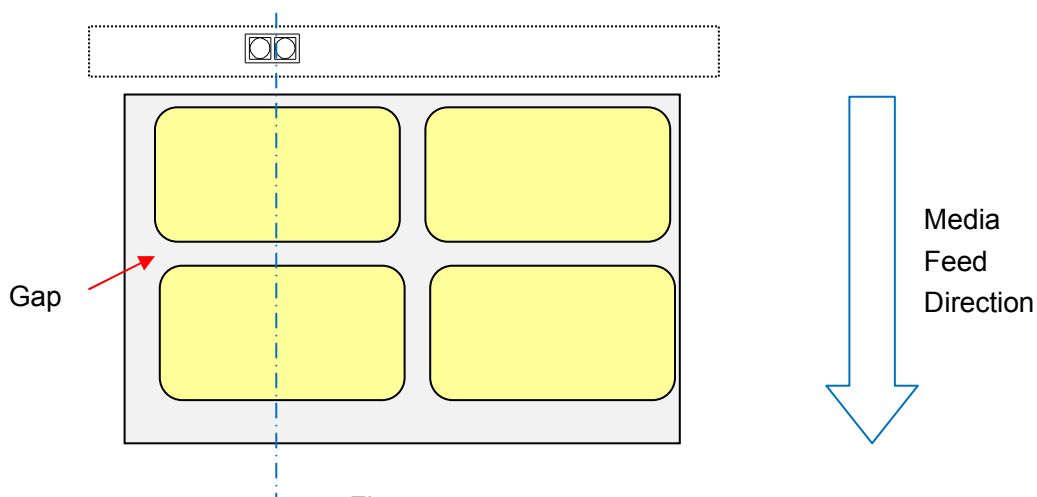


Figure 7-4

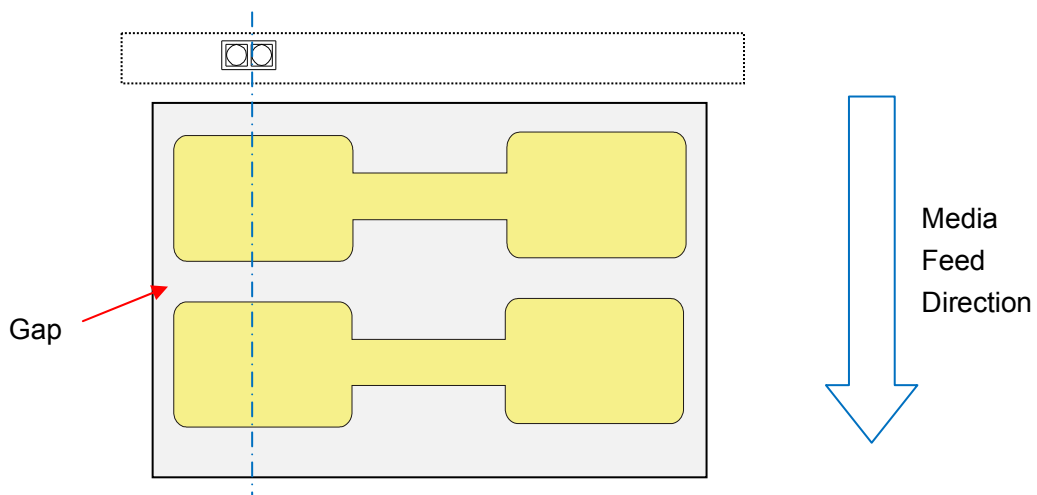


Figure 7-5

Operation

Power Switch

The power switch is on the rear of the printer. The symbols on the switch are defined as follows:

“—” — ON position.

“○” — OFF position.

Front Panel



The Front Panel of the printer consists of:

- Three Indicator Lights: MEDIA, READY and RIBBON
- Three function Keys: PAUSE, FEED and CANCEL

Indicator Lights

The three Lights indicate the status of the printer (please refer to Chapter4 for error indications)

READY

- **On:** Indicates the printer is in the normal state;
- **Flashing:** Indicates the printer is in the 'PAUSE' state.




MEDIA





- **On:** Indicates the printer is in the normal state;
- **Flashing simultaneously with READY:** Running out of media;





RIBBON

- **On:** Indicates thermal transfer printing;
- **Off:** Direct thermal printing (no ribbon requirements);
- **Flashing simultaneously with READY:** Running out of ribbon.

The Indicator lights combinations indicate the status of the printer as follows:

-  : The Indicator lights is Off
-  : The Indicator lights is On
-  : The Indicator lights is Flashing

Status	Indication
	In Thermal Transfer Mode: Printer is in the normal state
	In Direct Thermal Mode: Printer is in the normal state
	In Thermal Transfer Mode: Printing pause operation; Error printing data is found;
	In Direct Thermal Mode: Printing pause operation; Error printing data is found;

	In Thermal Transfer Mode: Media Out
	In Direct Thermal Mode: Media Out
	In Thermal Transfer Mode: Ribbon is Out
	Enter Advance Function Mode

Keys

The three keys have different functions based on the mode of the operation is performed.

Key Name	Basic Functions	Advanced Functions (see Advanced Functions below)
FEED	Feed one label	Media Sensor Calibration
PAUSE	<ul style="list-style-type: none"> - Press once to pause current print job - Press a second time to resume printing 	Self-test: The Printer performs a self-test and prints out a configuration report
CANCEL	<ul style="list-style-type: none"> - Cancel current batch of labels - Forces the printer to continue working after an error has been corrected 	Reset: Resets the printer to Factory Default Settings

Advanced Functions

Media Sensor Calibration

It is necessary to accomplish Media Sensor Calibration after a new roll of media has been loaded.

1. Press and hold the FEED key for about 4 seconds.
2. The printer will feed approximately 200mm of media;
3. The three indicators stop flashing and remain lit. The printer is back to a normal state.

Self Test

1. Press and hold the PAUSE key for about 4 seconds;
2. The printer will print out a configuration report and the three indicators will stop blinking and remain lit.
The printer is back to a normal state.
3. The following information will be printed on the self-test report:
 - Printer's model and part number.
 - Firmware version
 - Hardware configuration and status
 - DIP switch settings
 - Label parameters
 - Font list

Reset – Reset the Printer to the Factory Default Settings

Following the steps listed below allows you to reset the printer to the factory default settings.

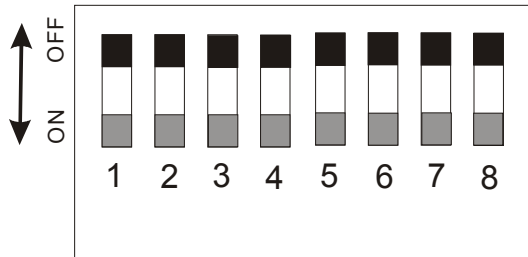
1. Press and hold the CANCEL key for 4 seconds, the three lamps will flash simultaneously (the printer will return to normal state automatically if no operations are performed within 4 seconds);
2. Release and press the CANCEL key again;
3. The three indicators stop flashing and remain lit. The printer is now in its normal state.

The following parameters have automatically been reset:

- Label
- Print darkness
- Speed
- Others

Note: The printed label count and printed length may not be reset.

DIP Switches at the rear of the printer



Note: Please turn off the printer before setting the DIP switches.

DIP Bit	Functions	Remarks
1	ON: Direct thermal print mode OFF: Thermal transfer print mode	Printing method setting Default: OFF
2	ON: Tear off position OFF: Edge of next label	Stop position setting Default: OFF
3	ON: Cutter is installed OFF: Cutter is not installed	Cutter setting Default: OFF
4	ON: Peeler is installed OFF: Peeler is not installed	Peeler settings Default: OFF
5	ON: Transmissive Media Sensor OFF: Reflective Media Sensor	Media Sensor type setting Default: OFF
6	ON: Enable IP setting OFF: Disable IP setting	IP address setup Default: OFF
7	7 8 OFF OFF – 9600,n,8,1 ON OFF – 19200,n,8,1	RS232 Serial Port baud rate setting Default: OFF | OFF
8	OFF ON – 38400,n,8,1 ON ON – 57600,n,8,1	

Windows Driver and X Label Software

The printer driver supports Windows 7/Vista/2003/XP/2000/NT operating systems. Each X Series printer comes with powerful barcode label edit software. Both the Windows driver and software are

available on the manufacturer's CD-ROM shipped with the product. If you do not have the manufacturer's CD-ROM or wish to upgrade your current software, it is available for download from: www.zmin.com.cn.

Note: If you need to update the driver, please remove any old versions of the driver before continuing.

Chapter 3 Maintenance

Caution:

1. **Make sure the printer is turned OFF before performing any maintenance operations.**
2. **The printhead becomes hot while printing, be careful when performing maintenance on the printhead.**
3. **Use only the cleaning agents indicated. ZMIN Technologies will not be responsible for damage caused by any other cleaning materials used on the printer.**
4. **Absolute alcohol is a solvent containing no more than one percent water. Absolute alcohol is a flammable solvent; always take the proper precautions when using this solvent.**

Cleaning the Printhead

The printhead is easily damaged due to its precision construction. A printhead damaged by misuse is not covered under the terms of the warranty. To ensure longevity of the printhead, please note the following:

1. Always use proper cleaning materials and techniques to clean the printhead. Never use hard materials for scraping the printhead.
2. Always use high-quality consumables. When the TPH module is closed, pressure is placed directly on the TPH; dirt such as paper scraps, sand, dust and glue can scrape or damage the printhead. The TPH is also easily damaged by static electricity, which may be generated by poor quality ribbons.
3. After every roll of ribbon or every three rolls of media, the printhead should be cleaned with absolute alcohol.
 - a. Turn off the printer and open the cover.
 - b. Release and lift the Printhead Module.
 - c. Remove the ribbon (if applicable).
 - d. Using a Cotton Swab dipped in absolute alcohol, rub the Swab along the printhead.

Cleaning the Platen Roller

Debris or dirt accumulated on the platen roller should be cleaned after every three rolls of media.

- a. Turn off the printer and open the cover.
- b. Release and lift the Printhead Module.
- c. Rotate the platen roller and clean it thoroughly with absolute alcohol and a cotton swab.

Cleaning the Printer Interior

With a brush or a vacuum cleaner, as needed.

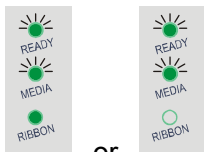
Chapter 4 Troubleshooting

Occasionally situations occur that require some troubleshooting. Possible issues and potential solutions are listed in this section. While not every situation is addressed, you may find some of these tips useful.

Error Indications

Typically, when the printer is not functioning, one or two of the three indicator lights will begin flashing. The possible situations addressed by the status of the three indicator lights are listed below.

READY and MEDIA lights flash simultaneously



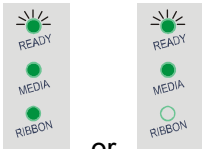
Possible Cause	Recommended Solutions	Remarks
Cannot detect the media gap or black line	(1) Check the media path (2) Check the position of the media sensor (3) Perform media sensor calibration	If you are using continuous media, be sure you have the correct settings in your software
Media run out	Load a roll of media	
Media jam	Clear the jam	
The Media Roll Guides are not firmly positioned against the media	Adjust the Media Roll Guides to firmly press against the media	
Media sensor error	Service media sensor	

READY and RIBBON lights flash simultaneously



Possible Cause	Recommend Solutions	Remarks
Run out of ribbon	Load a roll ribbon	
Ribbon jam	Clear the jam	
Ribbon Sensor error	Service Ribbon Sensor	To be serviced only by qualified personnel

Only READY light flash



Please confirm whether you have pressed the PAUSE key or not, force the print enter print pause state?

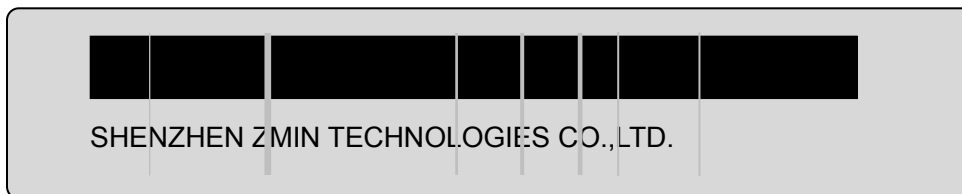
Please press PAUSE key, if the problem is still exist, it's may be the following list cause:

Possible Cause	Recommend Solutions	Remarks
Serial I/O error	Check DIP switches for the baud rate settings	
Memory overflow	a. Restart the printer b. Perform Reset	

Miscellaneous

Vertical blank lines

Continuous vertical blank lines in printout indicate a dirty or faulty printhead as shown below:



If the problem cannot be solved by cleaning the printhead, replace the printhead.

The host shows 'Printer Timeout'

1. Check if the interface cable is connected.
2. Check if the printer is turned on.

If the situation remains unsolved, please contact your reseller or our customer service engineer.

The data has been sent, but not printing

1. Verify you have chosen the correct Windows printer.
2. Reset the printer.

If the situation remains unsolved, please contact your reseller or our customer service engineer.

Print quality problems

1. Adjust Print Darkness setting.
2. Adjust Print Speed setting.
3. Clean the printhead and platen roller.
4. Make sure the correct media/ribbon is loaded.
5. Use only high-quality Media, replace if necessary.

Recovery

After the corrective action is taken press the CANCEL key to clear the alarm, the printer will get back to work automatically.

Others

Contact a qualified Service Engineer from your reseller or ZMIN Technologies for troubles that persist or are not covered in this section.

Appendix A: Interface Specifications

RS232 Serial

The RS232 connector on the printer is a DB9F:

Pin	Direction	Definition
1	/	/
2	Out	TX
3	In	RX
4	In	DTR
5	-	Ground
6	Out	DSR
7	In	CTS
8	Out	RTS
9	/	/

Connection with host:

Host 25S	Printer 9P	Host 9S	Printer 9P
TX 2	..... 3 RX	RX 2	..... 2 TX
RX 3	..... 2 TX	TX 3	..... 3 RX
DSR 6	..... 6 DSR	DTR 4	..... 4 DTR
DTR 20	..... 4 DTR	DSR 6	..... 6 DSR
RTS 4	..... 7 CTS	RTS 7	..... 7 CTS
CTS 5	..... 8 RTS	CTS 8	..... 8 RTS
GND 7	..... 5 GND	GND 5	..... 5 GND

Alternately you can just connect the 3 wires as follows:

Host 25S	Printer 9P	Host 9S	Printer 9P
TX 2	..... 3 RX	RX 2	..... 2 TX
RX 3	..... 2 TX	TX 3	..... 3 RX
GND 7	..... 5 GND	GND 5	..... 5 GND
pin 4	□	pin 4	□
pin 5	□	pin 6	□
pin 6	□	pin 7	□

pin 20

pin 8

Baud rate: 9600, 19200, 38400, 57600

(Baud Rate set by DIP switches 7–8)

Data format: always 8 data bits, 1 start bit and 1 stop bit.**Parity :** always non parity.**Flow control:** RTS/CTS (Hardware flow control).

If you are using software or drivers under the Windows environment, the flow control must be set to “hardware”

Parallel (Centronics)

The parallel port is a standard 36-pin Centronics interface. Its pin assignments are as follows:

Pin	Direction	Definition	Pin	Direction	Definition
1	In	/STROBE	13	Out	SELECT
2	In	Data 1	14,15		NC
3	In	Data 2	16	-	Ground
4	In	Data 3	17	-	Ground
5	In	Data 4	18		NC
6	In	Data 5	19~30	-	Ground
7	In	Data 6	31		NC
8	In	Data 7	32	Out	/Fault
9	In	Data 8	33~36	-	NC
10	Out	/ACK			
11	Out	BUSY			
12	Out	PE			

Note: Never send data from 2 ports at the same time. Data cannot be sent to more than one port simultaneously or data corruption and print errors may occur.

Appendix B: ASCII Table

	0	1	2	3	4	5	6	7
0	NUL			0	@	P	`	p
1	SOH	XON	!	1	A	Q	a	q
2	STX		"	2	B	R	b	r
3		XOFF	#	3	C	S	c	s
4			\$	4	D	T	d	t
5		NAK	%	5	E	U	e	u
6	ACK		&	6	F	V	f	v
7	BEL		'	7	G	W	g	w
8	BS		(	8	H	X	h	x
9			)	9	I	Y	i	y
A	LF		*	:	J	Z	j	z
B		ESC	+	;	K	[	k	{
C	FF		,	<	L	\	l	|
D	CR		-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	DEL

Remark: The € sign is included in the embedded table at DEC128 (HEX 80).



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* 8 0 1 0 0 0 1 0 0 2 *