PEX-1120/ PEX-1130/ PEX-1160 Series
PEX-1220/ PEX-1230/ PEX-1260 Series

THERMAL TRANSFER / DIRECT THERMAL PRINT ENGINE

SERVICE MANUAL

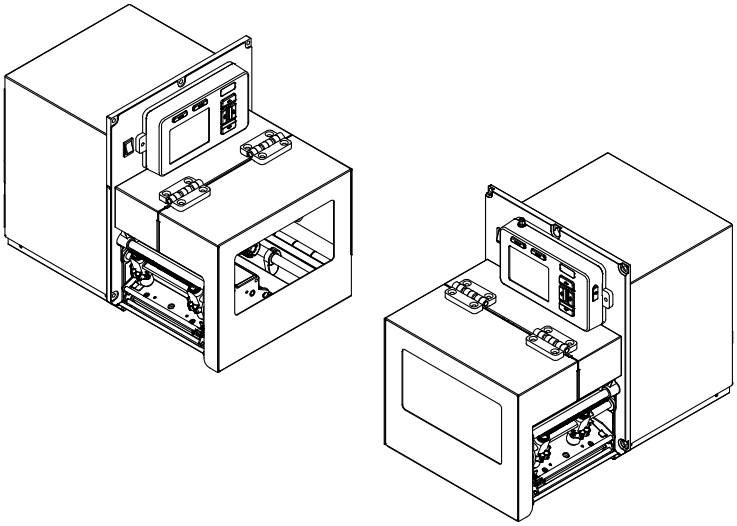


TABLE OF CONTENT

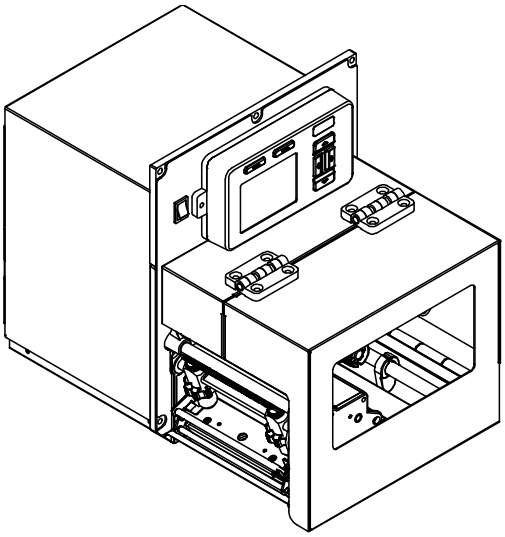
1. FUNDAMENTAL OF THE SYSTEM 1
1.1. Print Engine Orientation 1
1.2. Overview 2
2. ELECTRONICS 5
2.1 Summary of Board Connectors 5
2.2 Interface Pin Configuration 7
3. MECHANISM 9
3.1 Replacing the Platen Roller Assembly 9
3.2 Replacing the Print head Assembly 10
3.3 Remove the Electronics Cover 13
3.4 Replacing the Power Supply Unit 14
3.5 Replacing Multi-interface (GPIO & parallel) Board 16
3.6 Replacing the Main Board 19
3.7 Replacing the Gap/Black Mark Sensor Module 20
3.8 Replacing the Panel Control Board & LCD Panel 22
3.9 Replacing the Bluetooth Module & Wi-Fi Module 24
3.10 Replacing the Stepping Motor Assembly 25
3.11 Replacing the Peel-off Roller Module 26
4. TROUBLESHOOTING 31
4.1 Common Problems 31
4.2 Mechanism Fine Adjustment to Avoid Ribbon Wrinkles 35
4.3 Adjusting Heater Line 37
5. MAINTENANCE 42
UPDATE HISTORY 44

1. FUNDAMENTAL OF THE SYSTEM

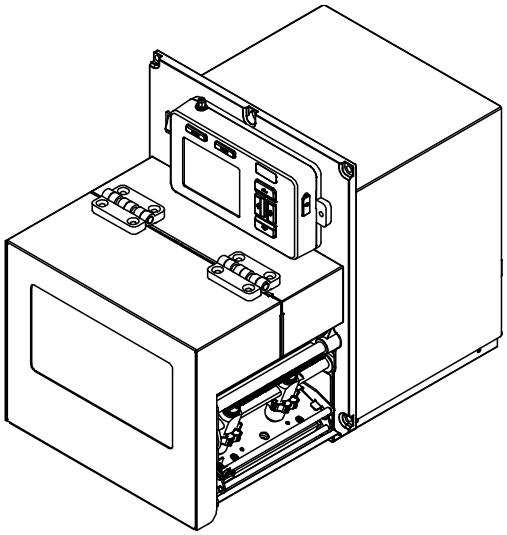
1.1. Print Engine Orientation

The PEX-1000 series are available in a left-hand configuration and a right-hand configuration.

PEX-1120/ PEX-1130/ PEX-1160 series
Left-hand model



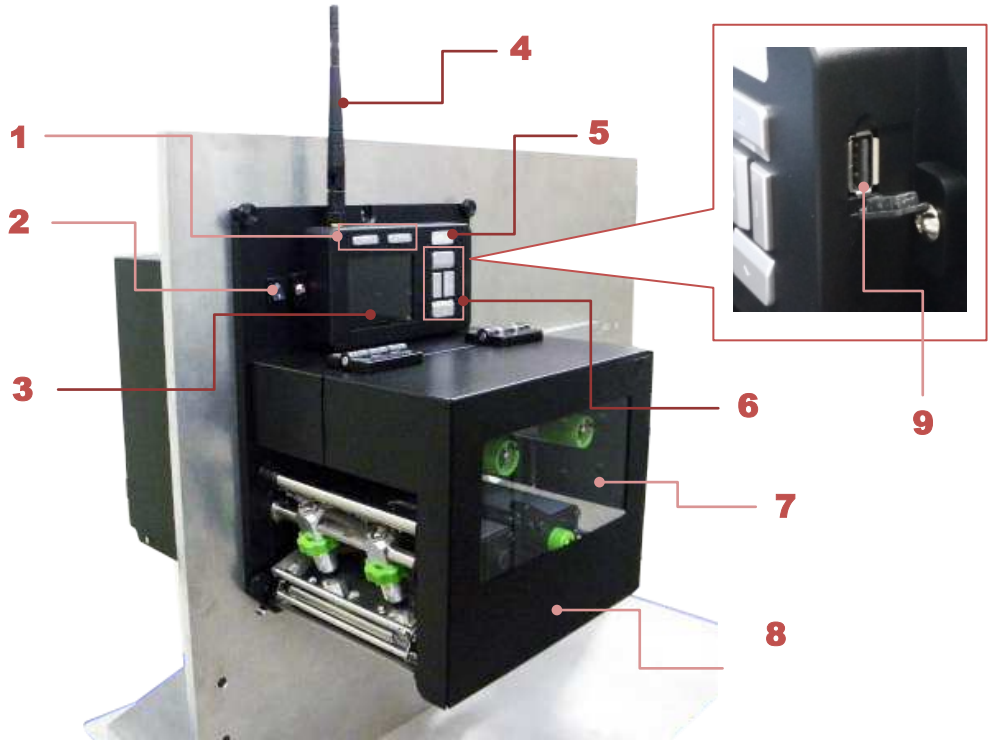
PEX-1220/ PEX-1230/ PEX-1260 series
Right -hand model



Note:
This document is going to show the components inside the media compartment of a left-hand print engine. A right-hand unit contains a mirror image of those components. Familiarize yourself with those components before continuing with the print engine setup procedure.

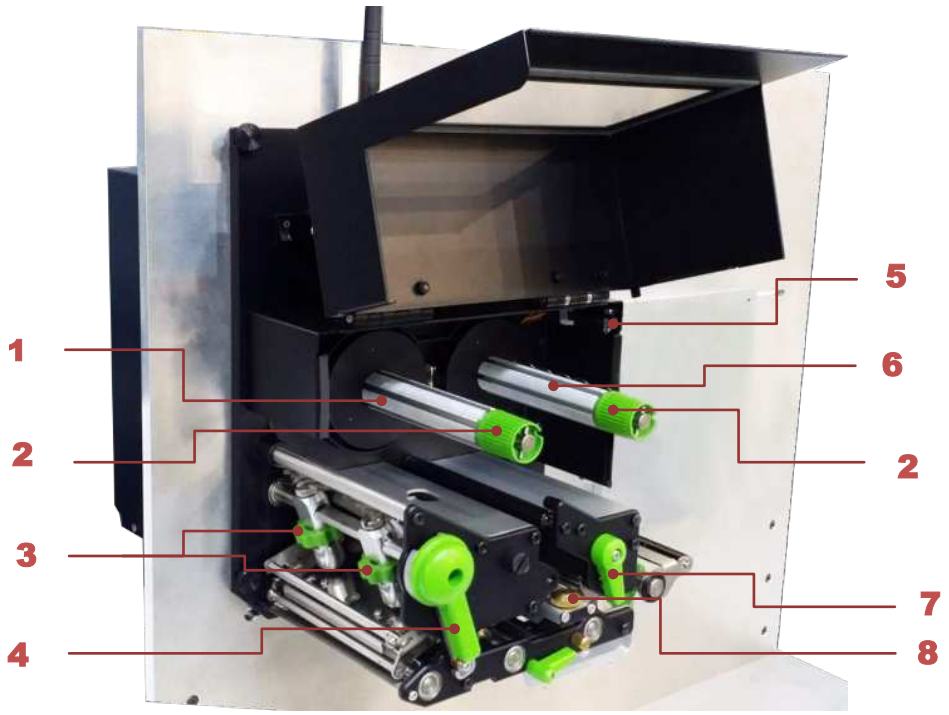
1.2. Overview

Front View

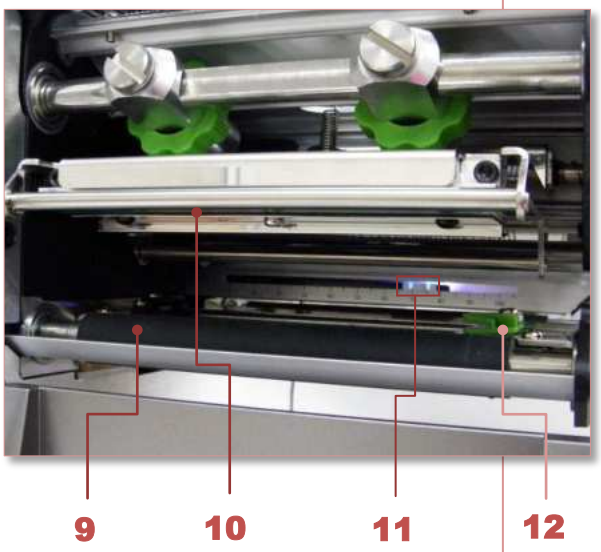


1. Soft keys
2. Power switch
3. LCD display
4. Wi-Fi antenna (option)
5. LED indicator
6. Navigational keys
7. Media view window
8. Print engine cover
9. USB host

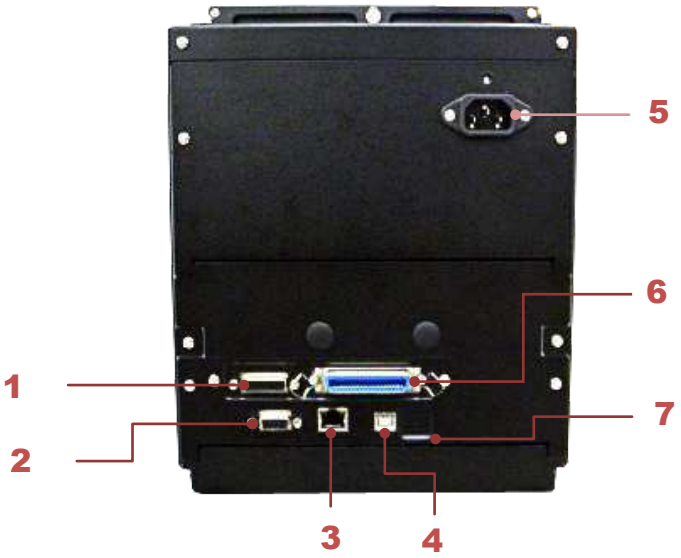
Interior View



1. Ribbon rewind spindle
2. Ribbon tension adjustment knobs
3. Print head pressure adjustment knobs
4. Print head release lever
5. Print engine cover open sensor
6. Ribbon supply spindle
7. Label guide bar release lever
8. Media sensor position adjustment knob
9. Platen roller
10. Print head
11. Media sensor
12. Label guide



Rear View



1. GPIO interface (Applicator interface with DB15F connector +5V I/O)
2. RS-232C interface
3. Ethernet interface
4. USB interface
5. Power cord socket
6. Centronics interface
7. * Micro SD card socket

Note:
The interface picture here is for reference only. Please refer to the product specification for the interfaces availability.

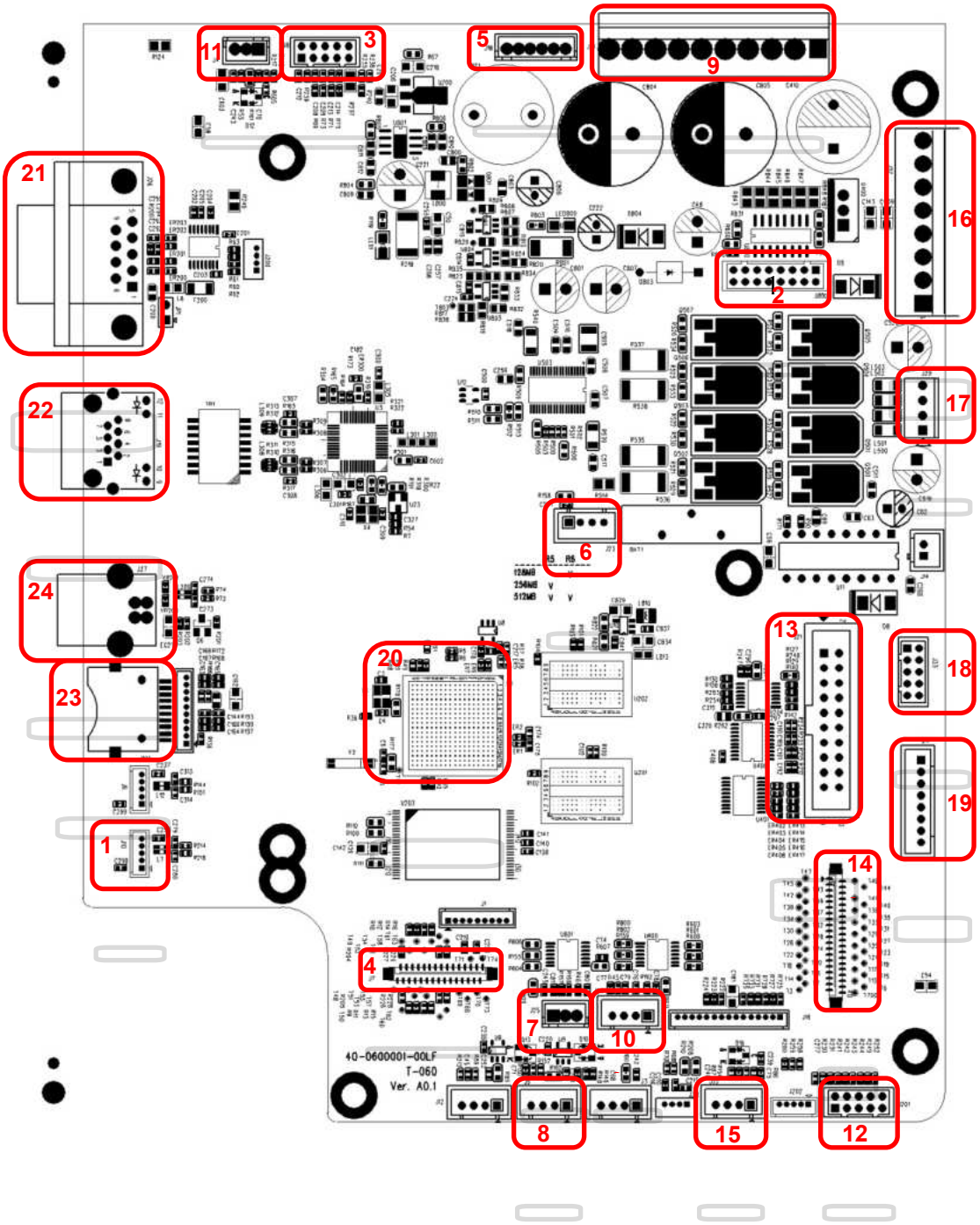
*** Recommended SD card specification**

Type	SD card spec	SD card capacity	Approved SD card manufacturer
Micro SD	V2.0 Class 4	4G	Transcend
	V2.0 Class 4	8G	Transcend
	V3.0 Class 10 UHS-I	16G	Transcend
	V3.0 Class 10 UHS-I	32G	Transcend
	V3.0 Class 10	16G	Kingston
	V2.0 Class 4	16G	Scandisk
	V3.0 Class 10 UHS-I	16G	Scandisk

- The DOS FAT file system is supported for the SD card.
- Folders/files stored in the SD card should be in the 8.3 filename format.
- The miniSD/microSD card to SD card slot adapter is required.

2. ELECTRONICS

2.1 Summary of Board Connectors



Main board

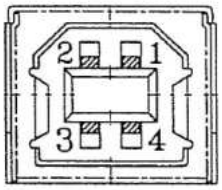
Connector	Description
1	USB Host connector
2	Power supply output (5V~24V DC) connector
3	Wi-Fi Module connector
4	Parallel Port board connector
5	GPIO interface board connector
6	Head open sensor connector
7	Gap sensor connector
8	Ribbon encoder sensor connector
9	Power supply output (24V DC) connector
10	BM Sensor connector
11	Paper Distance Sensor connector
12	BT module connector
13	Print head connector
14	LCD panel connector
15	Ribbon end sensor connector
16	TPH Power (24V DC) connector
17	Stepping motor connector
~~18~~	~~Cutter/peel-off connector~~
19	Paper REWIND connector
20	Micro processor
21	RS-232C connector
22	Ethernet interface
23	MICRO SD card socket
24	USB interface

2.2 Interface Pin Configuration

RS-232C

PIN	CONFIGURATION
1	+5 V
2	TXD
3	RXD
4	CTS
5	GND
6	RTS
7	N/C
8	RTS
9	N/C

USB

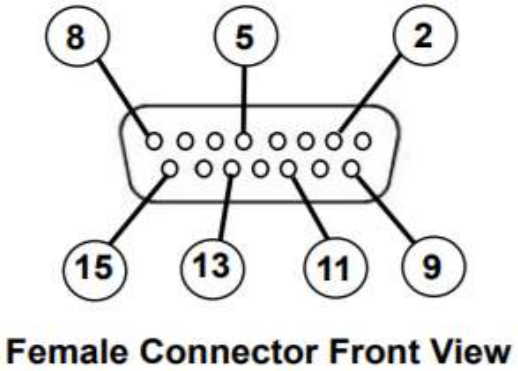


PIN	CONFIGURATION
1	N/C
2	D-
3	D+
4	GND

Ethernet

PIN	CONFIGURATION
1	Tx+
2	Tx-
3	Rx+
4	N/C
5	N/C
6	Rx-
7	N/C
8	N/C

GPIO (Applicator interface with DB15F connector +5V I/O)



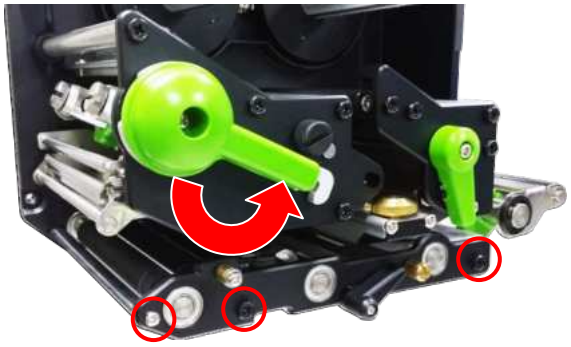
Pin	CONFIGURATION
1	GND
2	5V(JP2 short)
3	GPI_1
4	GPI_2
5	GPI_3
6	GPI_4
7	24V
8	GND
9	GPO_1
10	GPO_2
11	GPO_3
12	GPO_4
13	GPO_5
14	GPO_6
15	GPO_7

3. MECHANISM

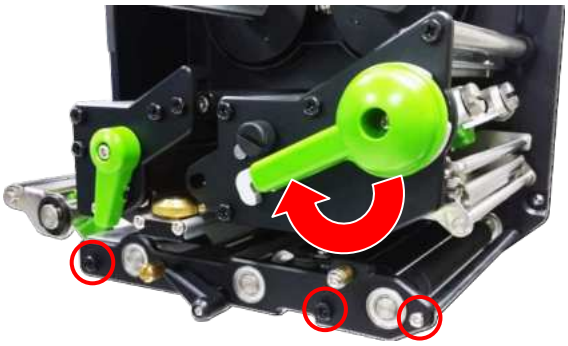
3.1 Replacing the Platen Roller Assembly

1. Open print engine cover.
2. Disengage print head release lever.
3. Remove three screws on the platen holder.

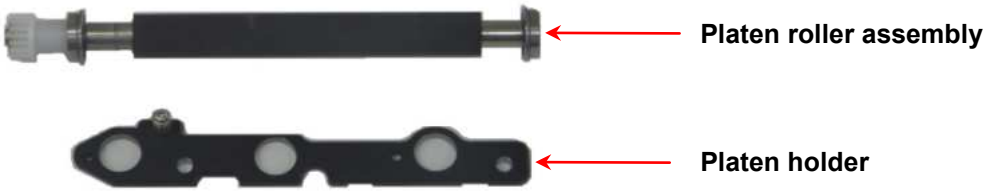
Left-hand model



Right -hand model



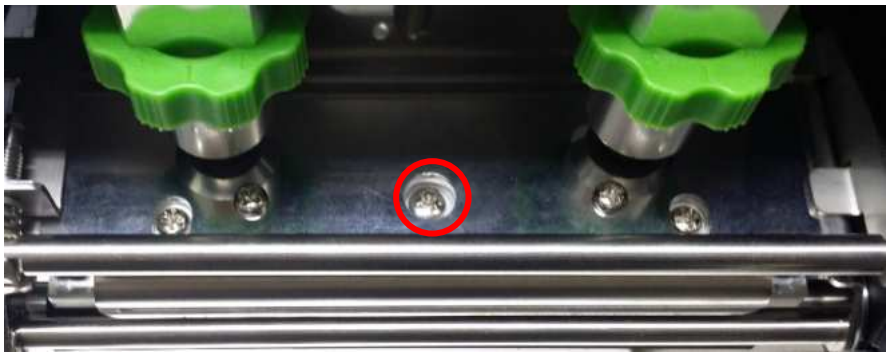
4. Take out the platen holder, tear bar and platen roller assembly and replace a new platen roller assembly.



5. Reassemble the parts in the reverse procedures.

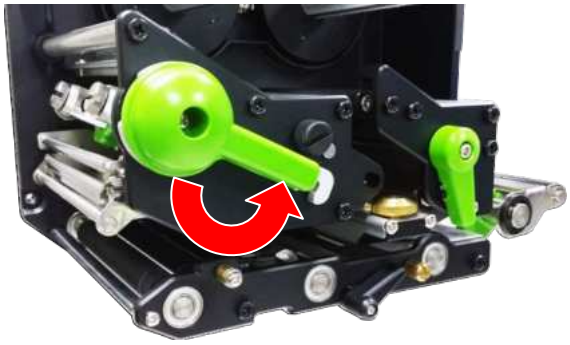
3.2 Replacing the Print head Assembly

1. Loosen the print head secure screw counterclockwise until it can be taken out from the mechanism.



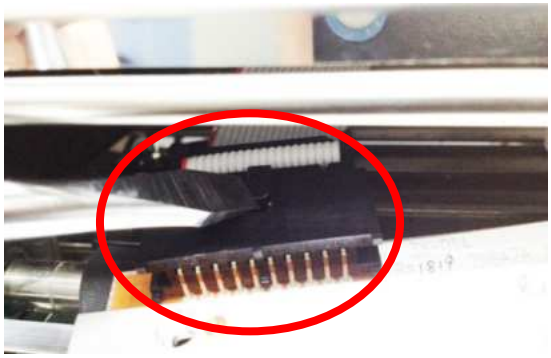
2. Disengage the print head release lever.

Left-handed configuration

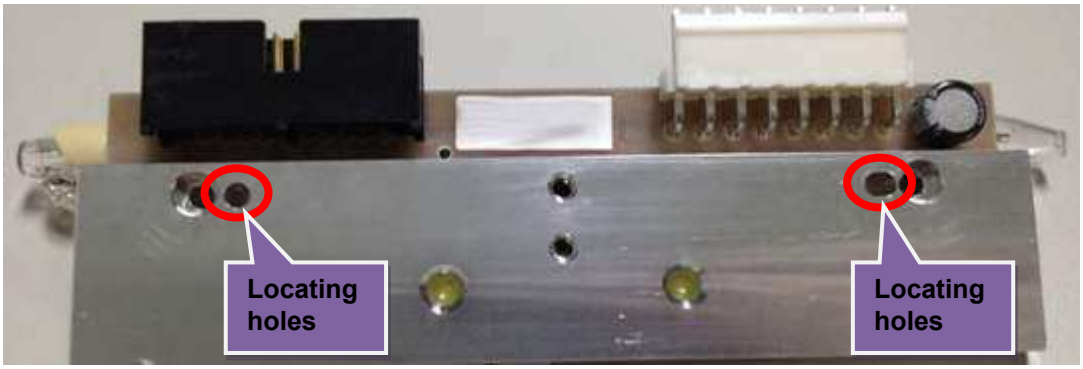


Right -handed configuration

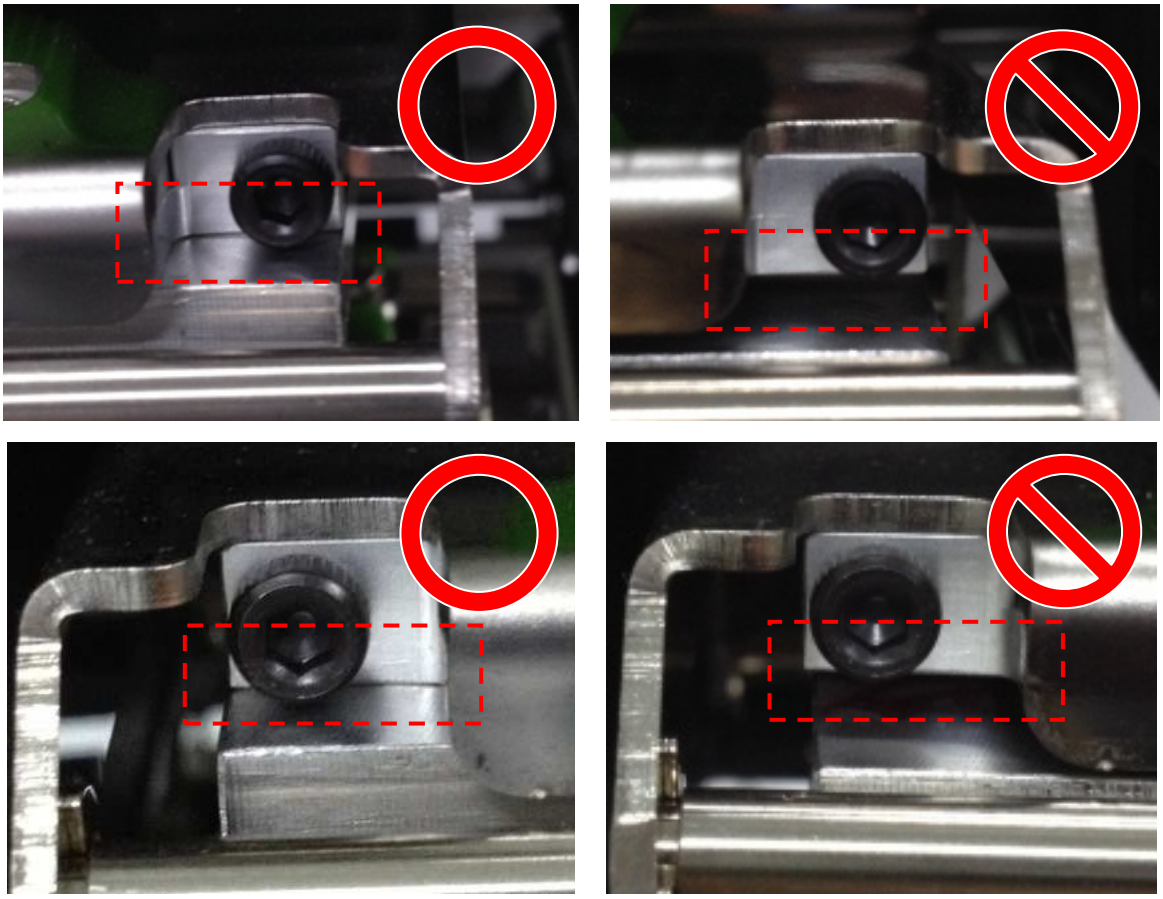
3. Carefully disconnect connectors from the print head assembly. Please do not pull the cable to right and left side alternatively in order to disconnect it from the print head connector. Please use the flat screw driver to push at the key in the middle of the connector. When the connector becomes loose from the print head connector, you can disconnect it.



4. Remove/Replace the print head assembly.
5. Connect the print head cable and carefully slide print head assembly into the print mechanism. Make sure the two locating protrusion pins on the print mechanism mounting plate snap into the locating holes on the print head.



6. Check the print head has been totally closed to the print mechanism before secure the print head by the previously removed thumbscrew.



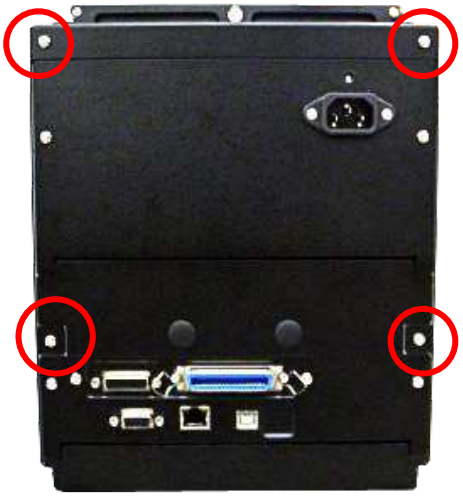
7. Reassemble the parts in the reverse procedures.

Note:

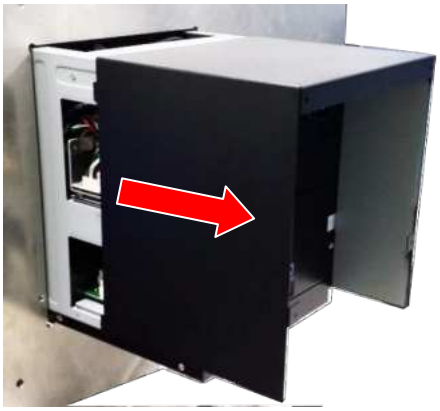
Please use the come with new print head secure screw to replace the print head assembly. DO NOT re-use the original screw.

3.3 Remove the Electronics Cover

1. Remove four screws on the electronics cover.



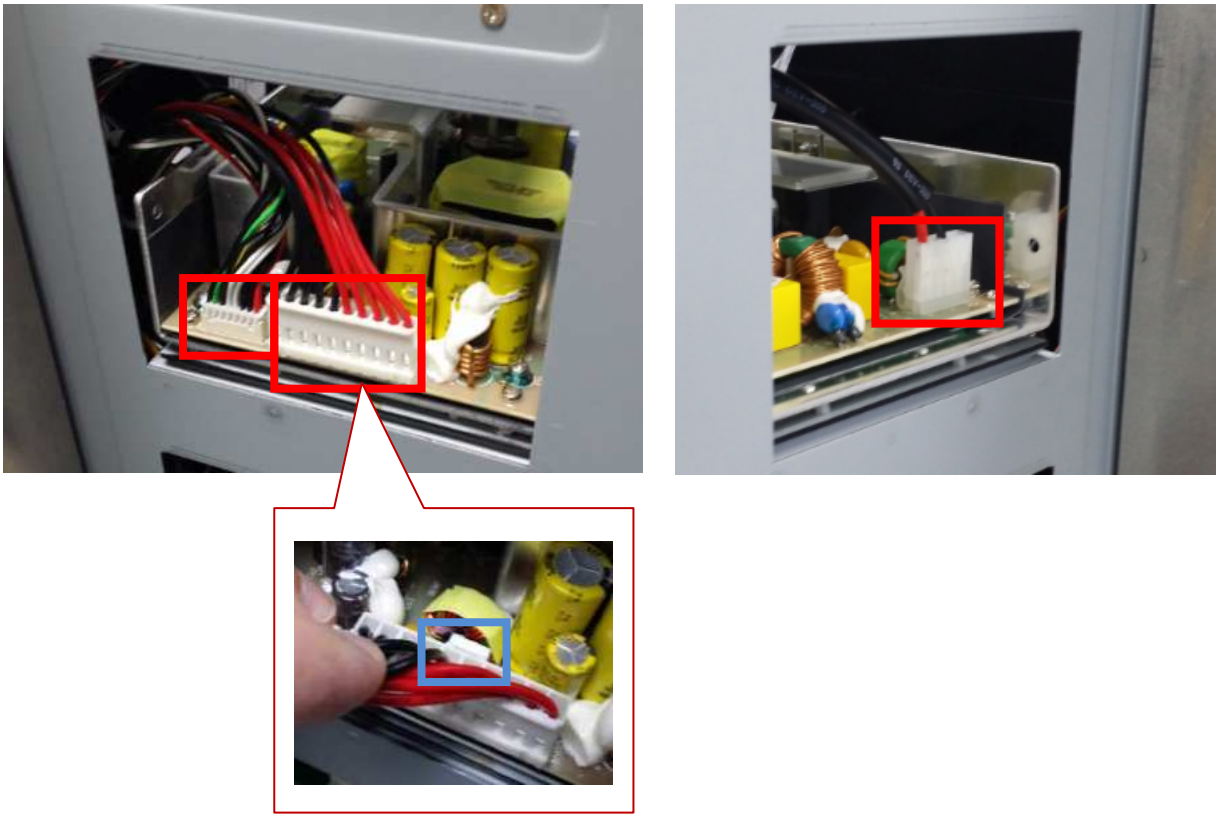
2. Draw out the electronics cover to remove it.



3. Reassemble the parts in the reverse procedures.

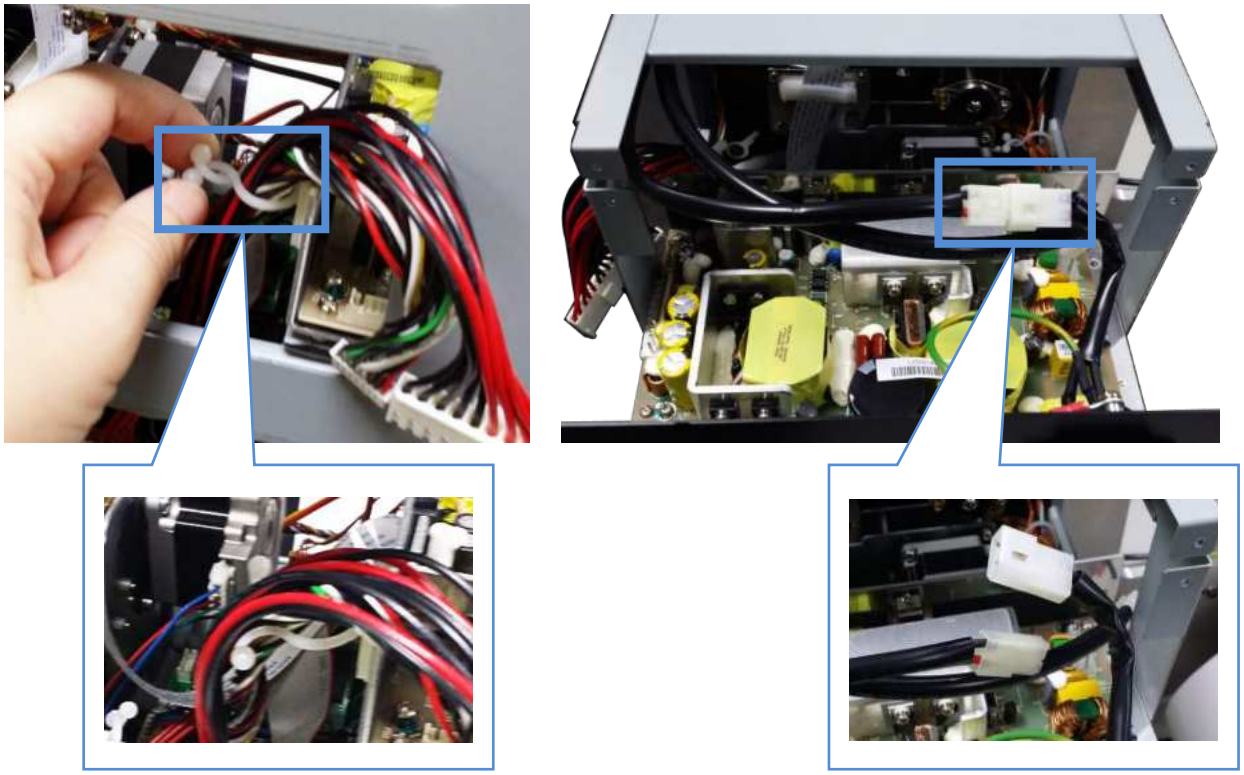
3.4 Replacing the Power Supply Unit

1. Refer to section 3.3 to remove the electronics cover.
2. Disconnect three connectors as shown.



3. Remove two screws on power supply cover.

4. Pull the power supply unit to loosen the cable tie and disconnect one connector as shown.



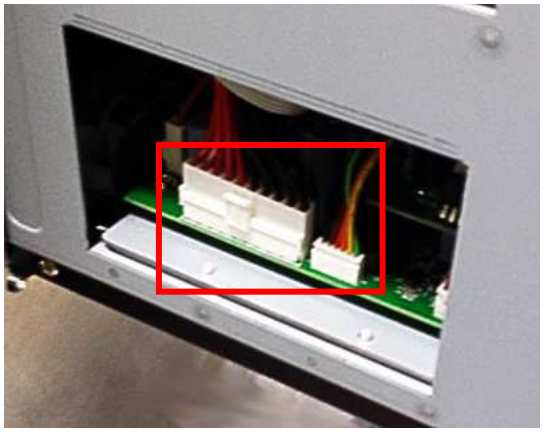
5. Remove/Replace the power supply unit.

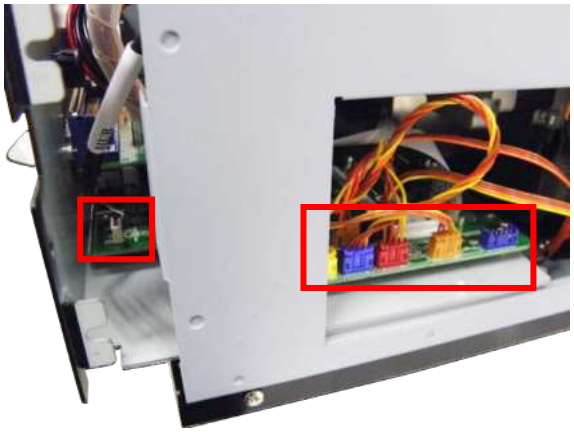
6. Reassemble the parts in the reverse procedures.

3.5 Replacing Multi-interface (GPIO & parallel) Board

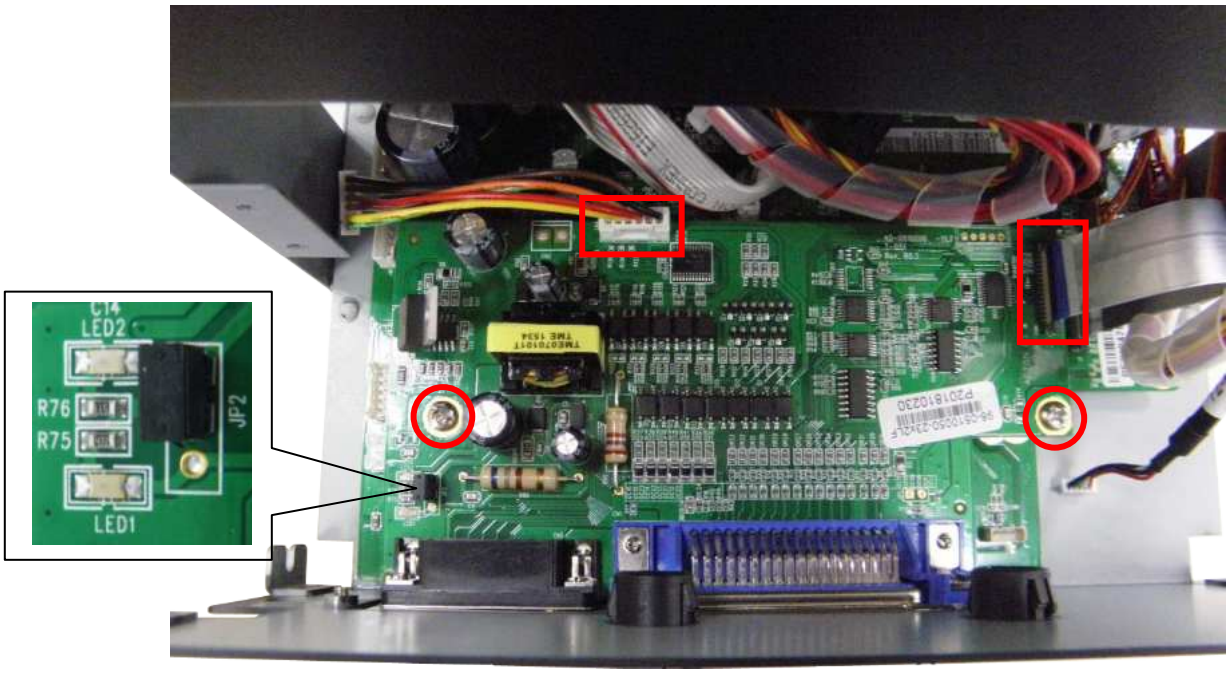
1. Refer to section 3.3 to remove the electronics cover.
2. Remove two screws on main board cover.

3. Disconnect the connectors as below shown first then disconnect all connectors on the main board to take out the main board unit.



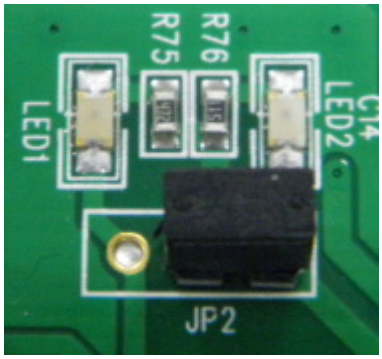
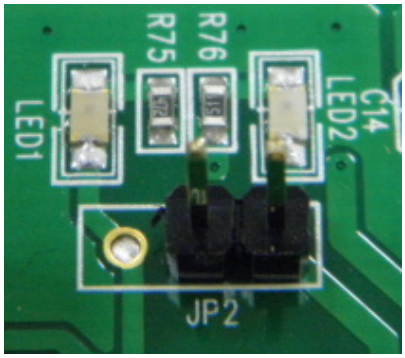


4. Disconnect two connectors and remove two screws on the multi-interface board.

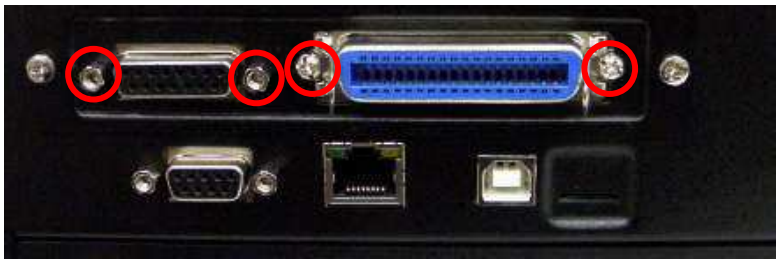


Note:

This GPIO interface (Applicator interface with DB15F connector +5V I/O) supports internal 5V power supply (default). For external power supply, please remove the jumper on main board JP2.

Internal power supply (5V I/O)	External power supply (5~24V I/O)
	

5. Remove four screws on the cover as shown to loosen the GPIO and parallel ports.



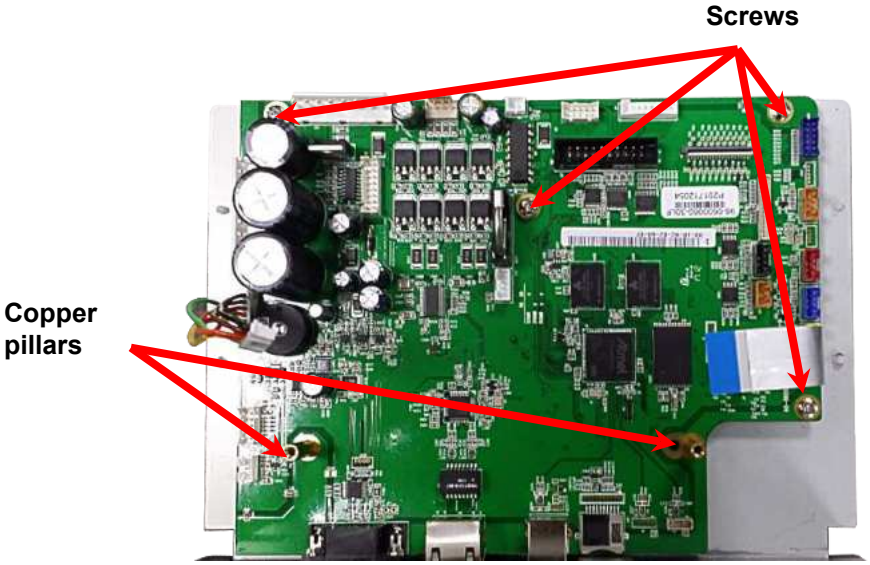
Note:

Remove two screws to replace multi-interface plate if necessary.

6. Remove/Replace the multi-interface board.
7. Reassemble the parts in the reverse procedures.

3.6 Replacing the Main Board

1. Refer to section 3.3 & 3.5 to remove the electronics cover and multi-interface board first.
2. Remove two copper pillars, four screws on the main board.

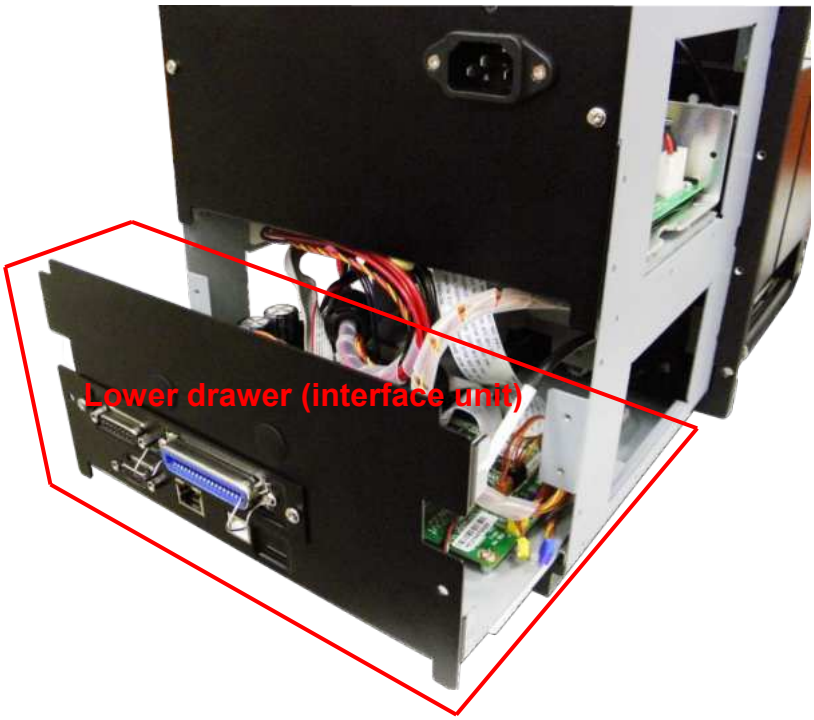


3. Remove two screws to loosen the serial port.

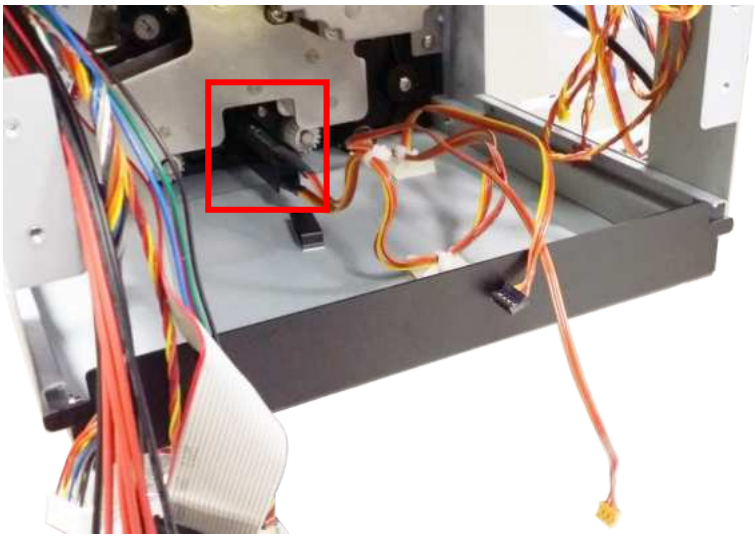
4. Remove/Replace the main board.
5. Reassemble the parts in the reverse procedures.

3.7 Replacing the Gap/Black Mark Sensor Module

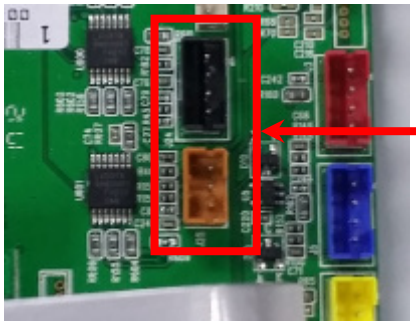
1. Refer to section 3.6 to remove all connectors on the multi-interface board and main board.
2. Pull the lower drawer (interface unit) and remove it.



3. Pull the media sensor module and loosen the cable ties.



4. Remove/Replace the gap/black mark sensor.



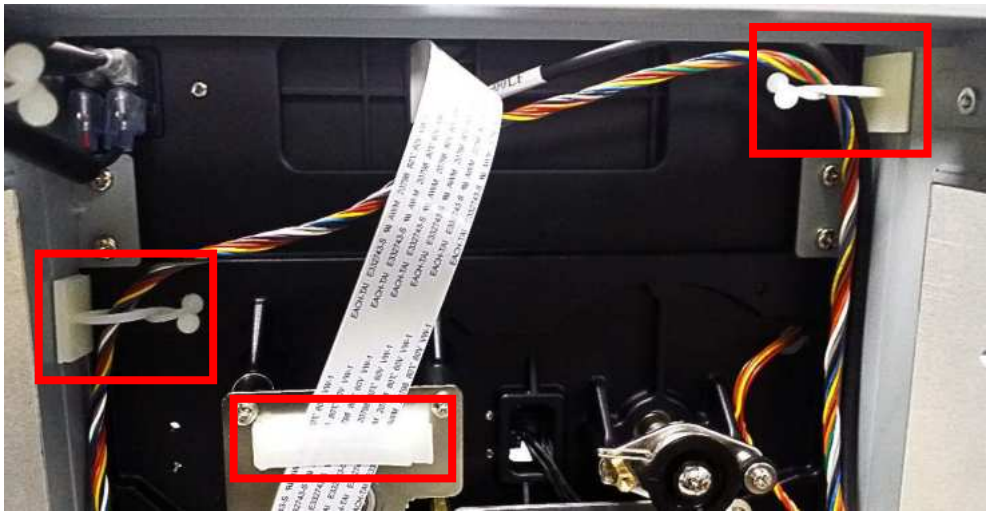
Gap/black mark sensor connectors

5. Reassemble the parts in the reverse procedures.

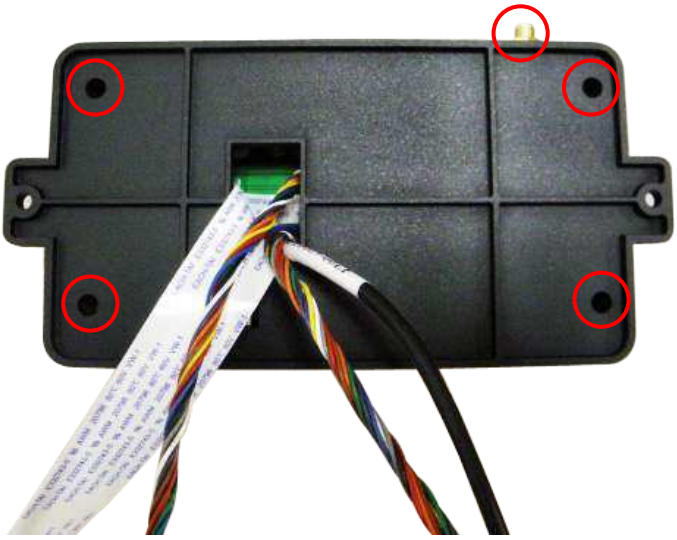
3.8 Replacing the Panel Control Board & LCD Panel

1. Refer to section 3.3, 3.4 and 3.5 to remove the electronics cover, power supply unit and interface unit.
2. Remove the marked fix LCD panel module two screws.

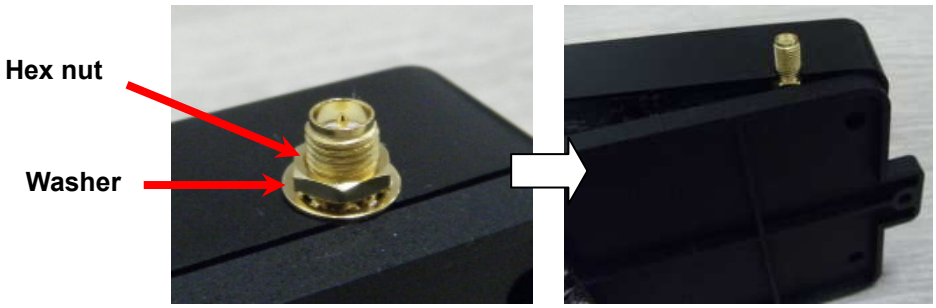
3. Loosen cable ties to remove the LCD panel assembly.



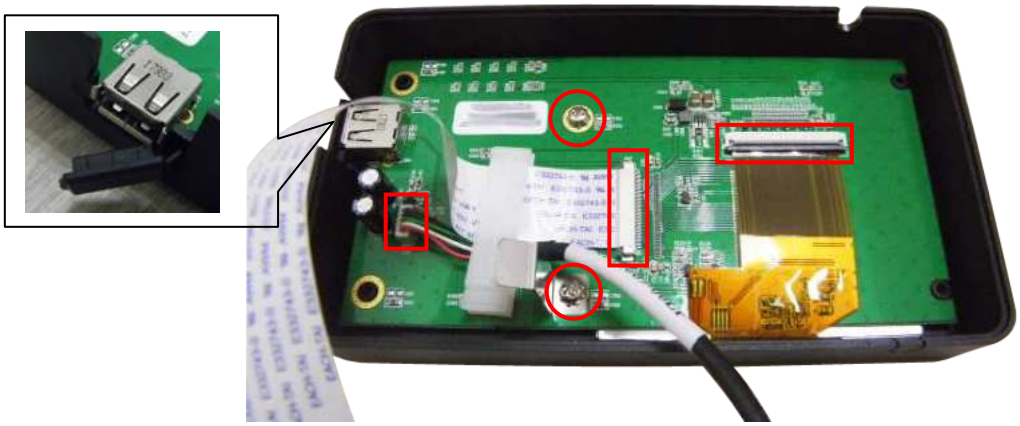
4. Remover four screws and antenna antenna.



5. Remover the hex nut and washer as shown to open the LCD cover.



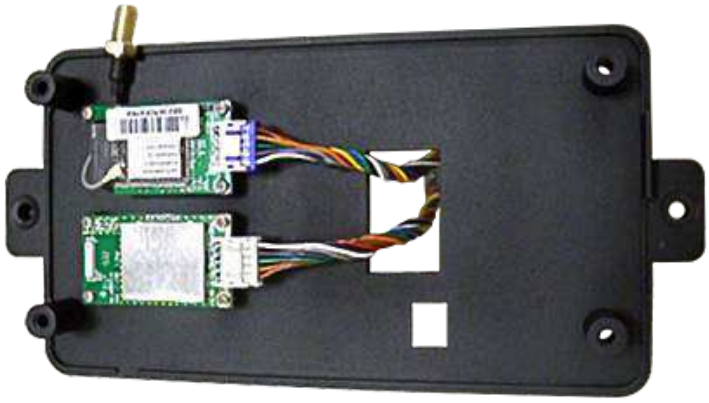
6. Remove two screws, three cables and open the USB host cover to replace the panel control board & LCD panel.
   Note:
   Please unlock the plug from connect for the flat cable, and carefully pull the flat cable free.



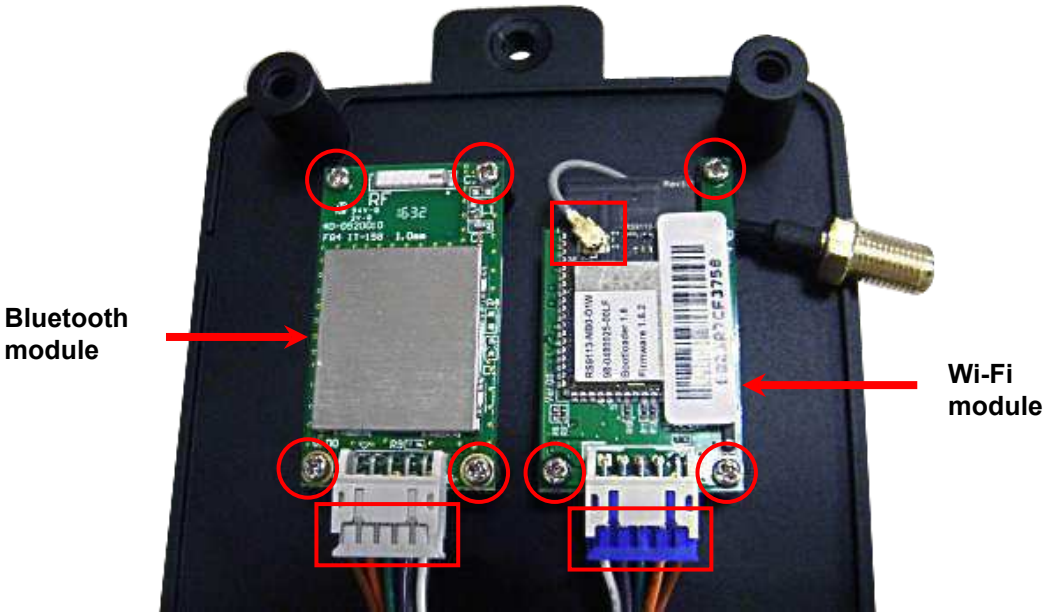
7. Reassemble the parts in the reverse procedures.

3.9 Replacing the Bluetooth Module & Wi-Fi Module

1. Follow the previous section 3.8 to open the LCD cover.



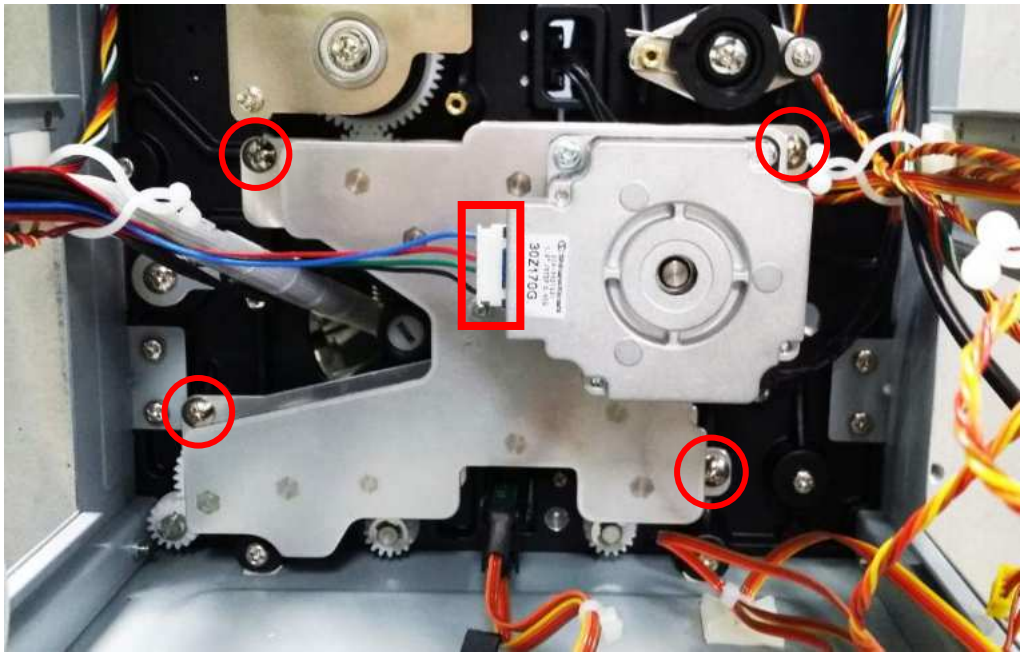
2. For Bluetooth module, disconnect one cable connector and four screws to replace it.
   For Wi-Fi module, disconnect one cable connector, three screws and one antenna connector to replace it.



3. Reassemble the parts in the reverse procedures.

3.10 Replacing the Stepping Motor Assembly

1. Follow the previous step (refer to section 3.3, 3.4 and 3.5) to remove the electronics cover, power supply unit and interface unit.
2. Remove four screws and one connector on the stepping motor assembly.



3. Remove/Replace the stepping motor assembly (including belt, gears, stepping motor)
4. Reassemble the parts in the reverse procedures.

3.11 Replacing the Peel-off Roller Module

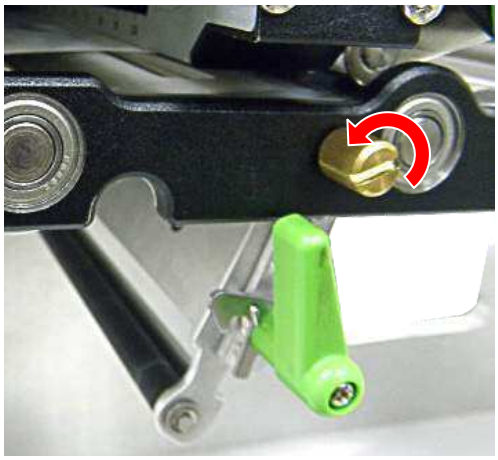
1. Open the peel-off roller release lever.

Left-handed configuration

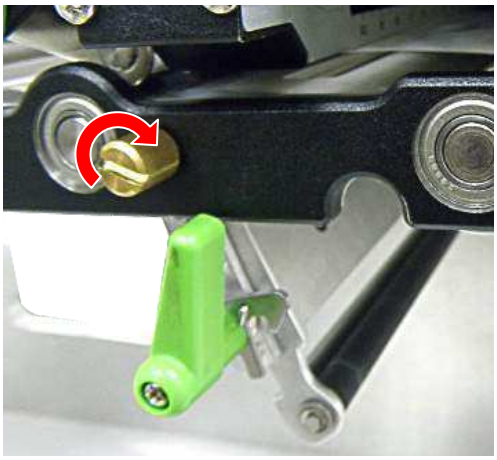
Right -handed configuration

2. Turn the thumb screw on the peel-off roller module to remove/replace the peel-off roller module.

Left-handed configuration



Right -handed configuration



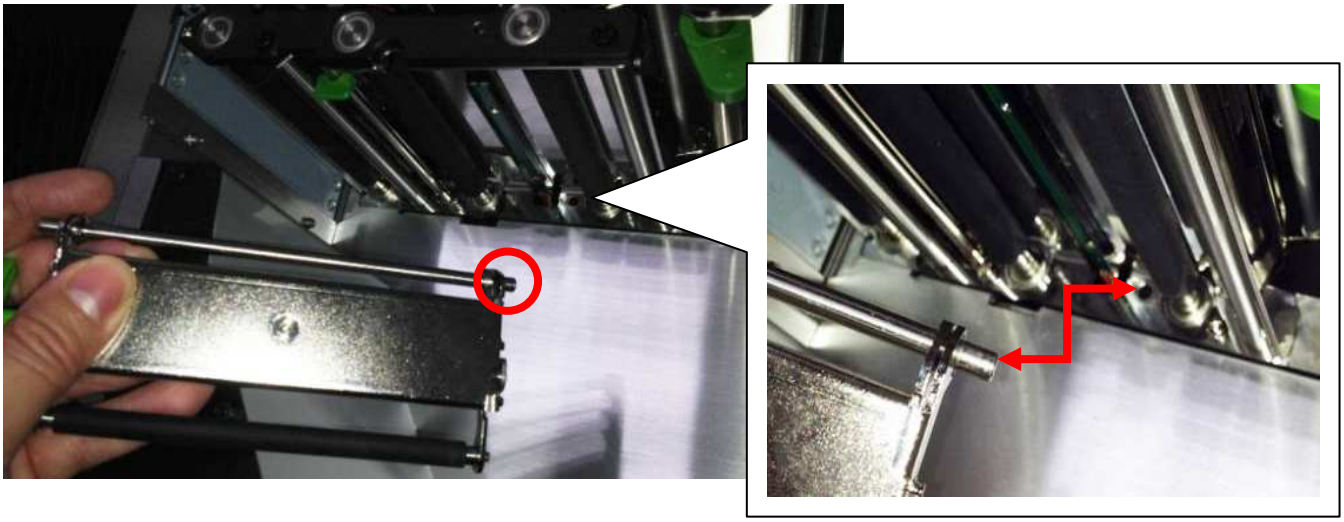
3. There is a locating hole between media sensor and rear paper-feed roller (most right one).

Left-handed configuration

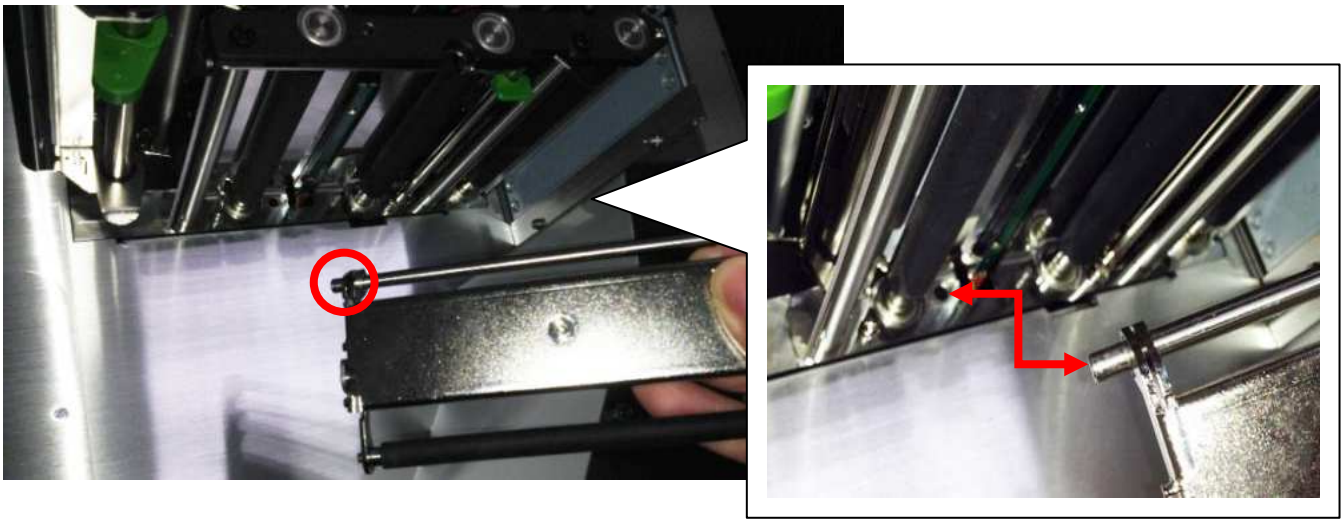
Right -handed configuration

4. Put the shaft of the peel-off roller module into the locating hole.

Left-handed configuration:

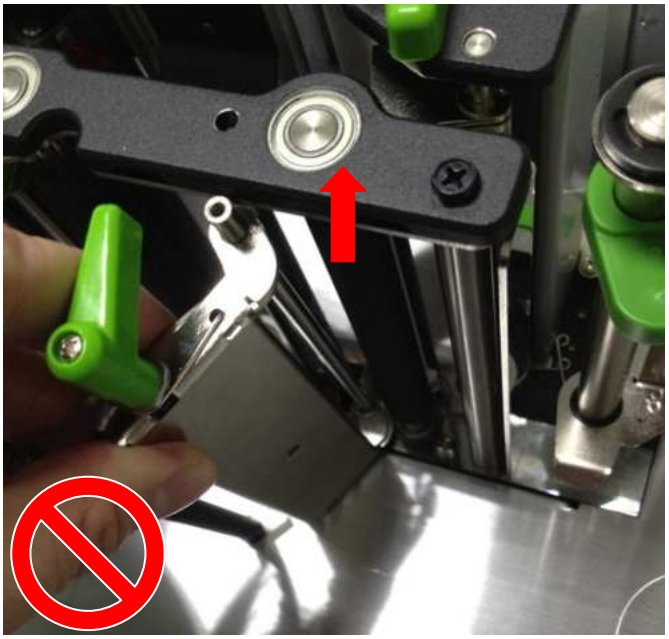


Right -handed configuration:



5. After putting shat into locating hole, at certain angle, the module would not be able to put inside. Please turn the module in the clockwise direct to put the module inside.

Left-handed configuration:



Right -handed configuration:

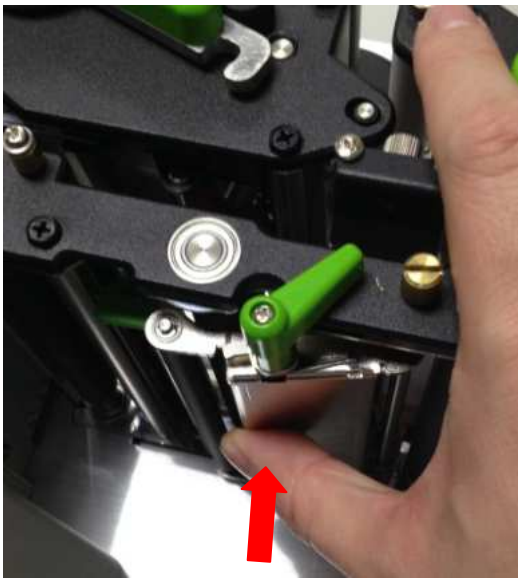
6. Put back the golden color screw, and turn it in the clockwise direction to fix the screw.

Left-handed configuration:

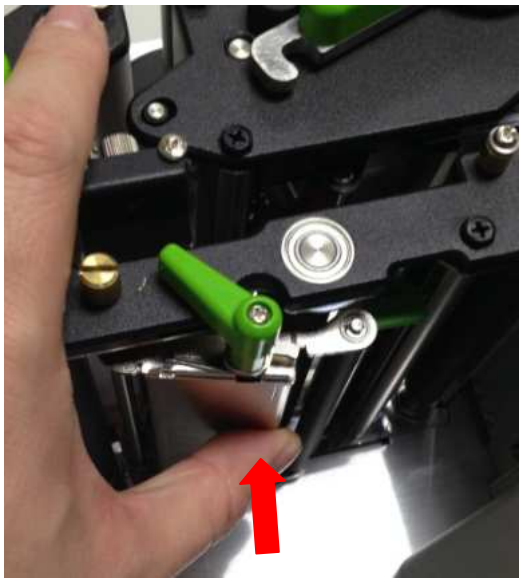
Right -handed configuration:

7. Pushing the peel-off roller module upward.

Left-handed configuration

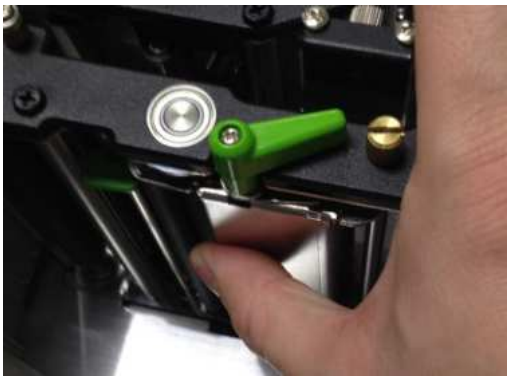


Right -handed configuration



8. After hearing the click sound, the module is fixed to its position without dangling. Finished the installation of peel-off roller module.

Left-handed configuration



Right -handed configuration

4. TROUBLESHOOTING

4.1 Common Problems

The following guide lists the most common problems that might be encountered when operating this bar code printer. If the printer still does not function after all suggested solutions have been invoked, please contact the Customer Service Department of your purchased reseller or distributor for assistance.

Problem	Possible Cause	Recovery Procedure
Power indicator does not illuminate	* The power cord is not properly connected.	* Plug the power cord in printer and outlet. * Switch the printer on.
`Carriage Open`	* The printer print head release lever or Rear paper feed roller release lever is not engaged.	* Please engage the release levers.
`No Ribbon`	* Running out of ribbon. * The ribbon is installed incorrectly.	* Supply a new ribbon roll. * Please refer to the steps in user's manual to reinstall the ribbon.
`No Paper`	* Running out of label. * The label is installed incorrectly. * Gap/black mark sensor is not calibrated. * Gap/black mark sensor is not on the media	* Supply a new label roll. * Please refer to the steps in user's manual to reinstall the label roll. * Calibrate the gap/black mark sensor. * Align the media sensor on top of the media or black mark or notch.
`Paper Jam`	* Gap/black mark sensor is not set correctly for the media * Make sure media width and height are set exactly same as actual media width and height. * Labels may be stuck inside the printer mechanism or media sensor	* Select the correct sensor for the media * Calibrate the gap/black mark sensor. * Set media width and height correctly. * Remove the stuck label inside the print mechanism or at the media sensor

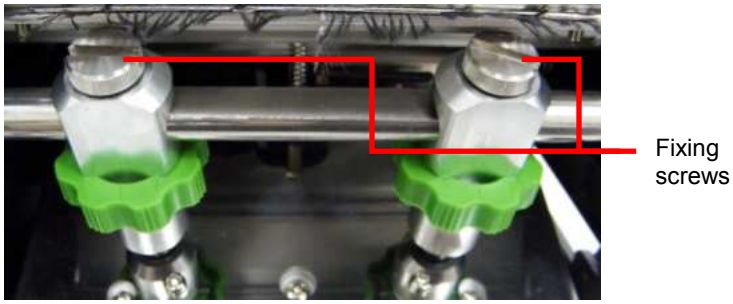
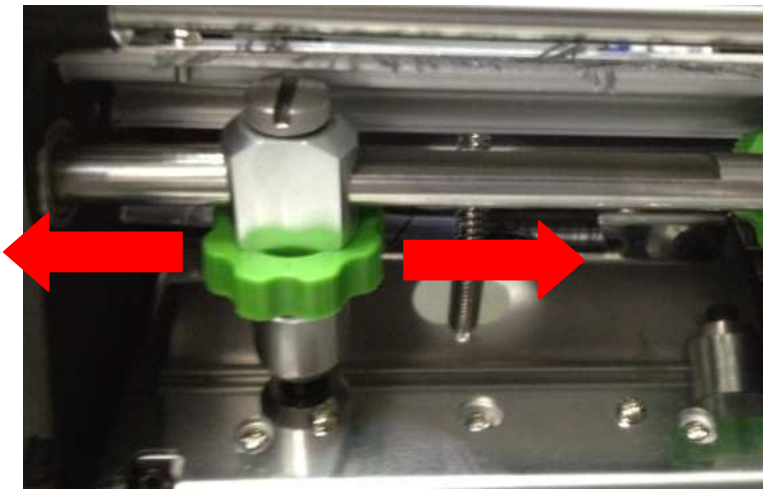
Not Printing	* Cable is not well connected to serial or USB interface or parallel port. * The serial port cable pin configuration is not pin to pin connected.	* Re-connect cable to interface. * If using serial cable, - Please replace the cable with pin to pin connected. - Check the baud rate setting. The default baud rate setting of printer is 9600,n,8,1. * If using the Ethernet cable, - Check if the Ethernet RJ-45 connector green LED is lit on.. - Check if the Ethernet RJ-45 connector amber LED is blinking. - Check if the printer gets the IP address when using DHCP mode. - Check if the IP address is correct when using the static IP address. - Wait a few seconds let the printer get the communication with the server then check the IP address setting again. * Chang a new cable. * Ribbon and media are not compatible. * Verify the ribbon-inked side. * Reload the ribbon again. * Clean the printhead. * The print density setting is incorrect. * Printhead's harness connector is not well connected with printheat. Turn off the printer and plug the connector again. * Check if the stepping motor is plugging in the right connector. * Check your program if there is a command PRINT at the end of the file and there must have CRLF at the end of each command line.
Memory full **(FLASH / DRAM)**	* The space of FLASH/DRAM is full.	* Delete unused files in the FLASH/DRAM. * The max. numbers of file of DRAM is 1024 files. * The max. user addressable memory space of DRAM is 8192 KB * The max. user addressable memory space of FLASH is 80 MB.
SD card is unable to use	* SD card is damaged. * SD card doesn't insert correctly. * Use the non-approved SD card manufacturer.	* Use the supported capacity SD card. * Insert the SD card again. * The supported SD card spec are listed in section 1.1.

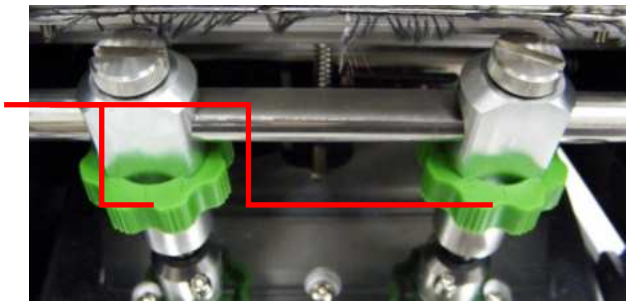
Poor Print Quality	* Ribbon and media is loaded incorrectly * Dust or adhesive accumulation on the print head. * Print density is not set properly. * Print head element is damaged * Ribbon and media are incompatible. * The print head pressure is not set properly	* Reload the supply. * Clean the print head. * Clean the platen roller. * Adjust the print density and print speed. * Run printer self-test and check the print head test pattern if there is dot missing in the pattern. * Change proper ribbon or proper label media. *Please refer to section 4.5 for avoiding the ribbon wrinkle * If the label thickness is more than 0.22 mm, the print quality might not be good enough, please adjust the heater line adjustment screw counter clockwise to get the best print quality. * The release lever does not latch the print head properly.
LCD panel is dark and keys are not working.	* The cable between main PCB and LCD panel is loose.	* Check if the cable between main PCB and LCD is secured or not.
LCD panel is dark but the LEDs are light.	* The printer initialization is unsuccessful.	* Turn OFF and ON the printer again. * Initialize the printer.
LCD panel is dark and LEDs are lit on, but the label is feeding forward.	* The LCD panel harness connector is loose.	* The LCD panel harness connector is plugged upside down.
Ribbon encoder sensor doesn't work.	* The ribbon encoder sensor connector is loose.	* Fasten the connector.
Ribbon end sensor doesn't work.	* The connector is loose. * The ribbon sensor hole is covered with dust.	* Check the connector. * Clear the dust in the sensor hole by the blower.
Label feeding is not stable (skew) when printing.	* The media guide does not touch the edge of the media.	* If the label is moving to the right side, please move the label guide to left. * If the label is moving to the left side, please move the label guide to right.
Skip labels when printing.	* Label size is not specified properly. * Sensor sensitivity is not set properly. * The media sensor is covered with dust.	* Check if label size is setup correctly. * Calibrate the sensor by Auto Gap or Manual Gap options. * Clear the GAP/Black mark sensor by blower.
Missing printing on the left or right side of label.	* Wrong label size setup.	* Set the correct label size.
RTC time is incorrect when reboot the printer.	* The battery has run down.	* Check if there is a battery on the main board.

Multi interface board doesn't work.	* The installation is incorrect.	* Check if the board is plugged in the right connector.
Power and Error LEDs are blinking fast.	* Power switch OFF and ON too fast.	* Turn off the printer and wait all LEDs are dark, and turn on the printer again.
Wrinkle Problem	* Printhead pressure is incorrect. * Ribbon installation is incorrect. * Media installation is incorrect. * Print density is incorrect. * Media feeding is incorrect.	* Please refer to the 5.2 chapter. * Please set the suitable density to have good print quality. * Make sure the label guide touch the edge of the media guide.
Gray line on the blank label	* The printhead is dirty. * The platen roller is dirty.	* Clean the printhead. * Clean the platen roller.
Irregular printing	* The printer is in Hex Dump mode. * The RS-232 setting is incorrect.	* Turn off and on the printer to skip the dump mode. * Re-set the Rs-232 setting.

4.2 Mechanism Fine Adjustment to Avoid Ribbon Wrinkles

This printer has been fully tested before delivery. There should be no ribbon wrinkle presented on the media for general-purpose printing application. Ribbon wrinkle is related to the media width, thickness, print head pressure balance, ribbon film characteristics, print darkness setting…etc. In case the ribbon wrinkle happens, please follow the instructions below to adjust the printer parts.

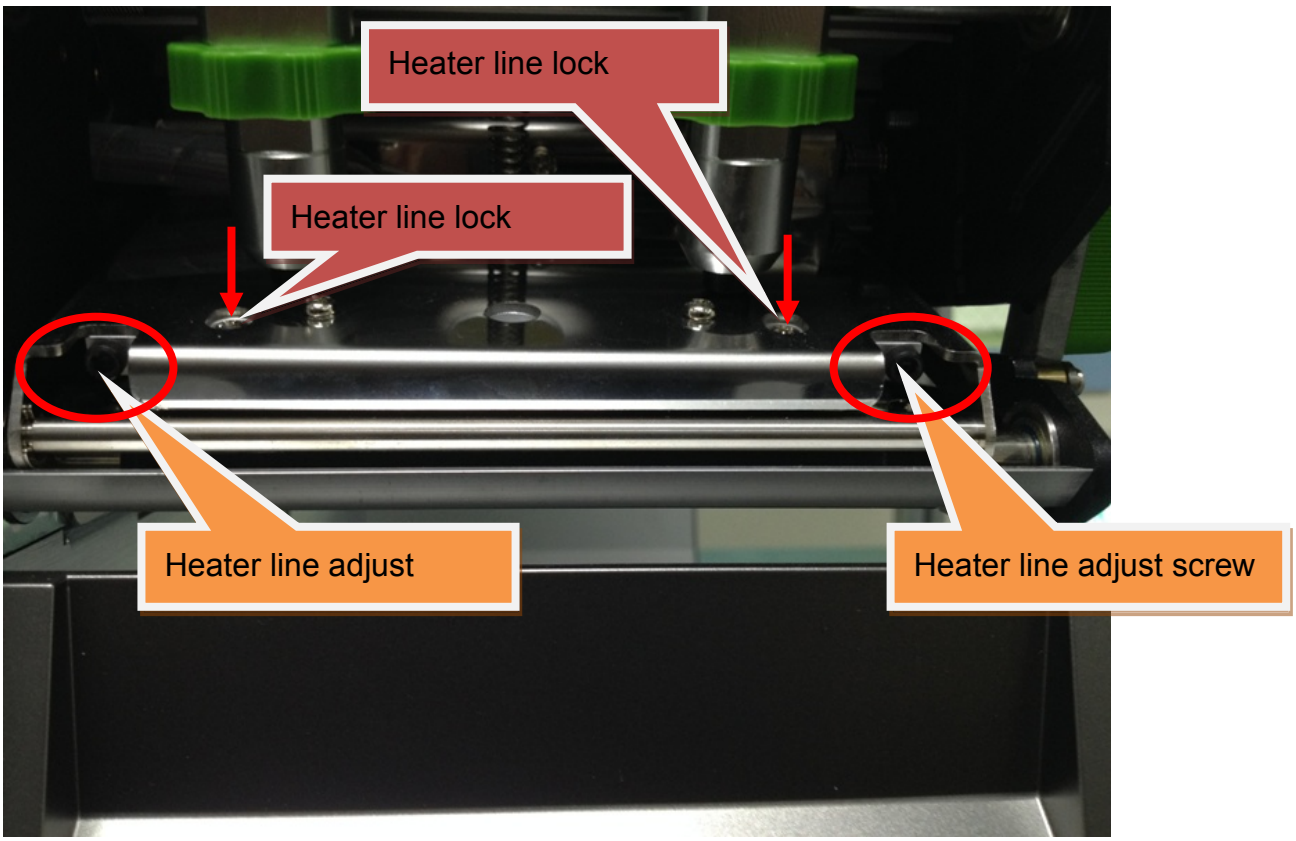
Pressure position	The pressure position can be adjusted by using a coin. Please use a coin to release the fixing screws as below show.  When using label its width is smaller than 2 inch. Please release the right side of pressure knob. Only use left side pressure and you may adjust the left side position, too. Once you find a position that has balance pressure on the label, the wrinkle will disappear. 

Pressure Volume	The print head pressure adjustment knob has 5 levels of settings. “1” is the lowest pressure and “5” is the maximum pressure. Clockwise direction adjustment is to increase the print head pressure. Please only turn the pressure knobs in clockwise direction.  	
Symptom	**1. Wrinkle happens from label lower left to upper right direction (“/”)**	**2. Wrinkle happens from label lower right to upper left direction (“\”)**
Wrinkle Example	 	
	If the wrinkle on the label starts from the lower left side to upper right side, please do following adjustment. 1. Decrease the right side print head pressure adjustment knob setting 1 level per each adjustment then print the label again to check if wrinkle is gone. 2. If the right side print head adjustment knob setting has been set to index 1 (the lowest pressure index), please increase the left side print head pressure.	If the wrinkle on the label starts from the lower right side to upper left side, please do following adjustment. 1. Decrease the left side print head pressure adjustment knob setting 1 level per each adjustment then print the label again to check if wrinkle is gone. 2. If the left side print head adjustment knob level has been set to index 1 (the lowest index), please increase the right side print head pressure.

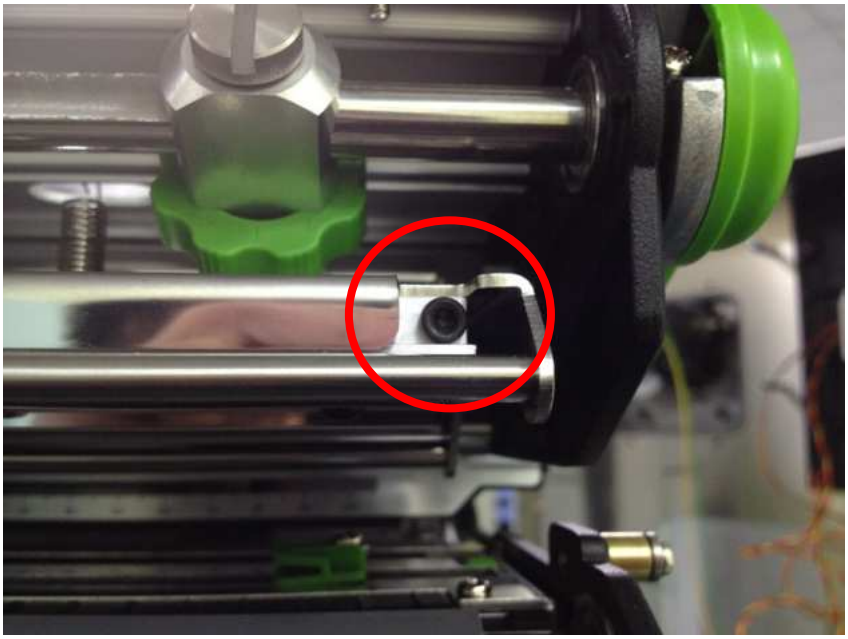
Feed direction

4.3 Adjusting Heater Line

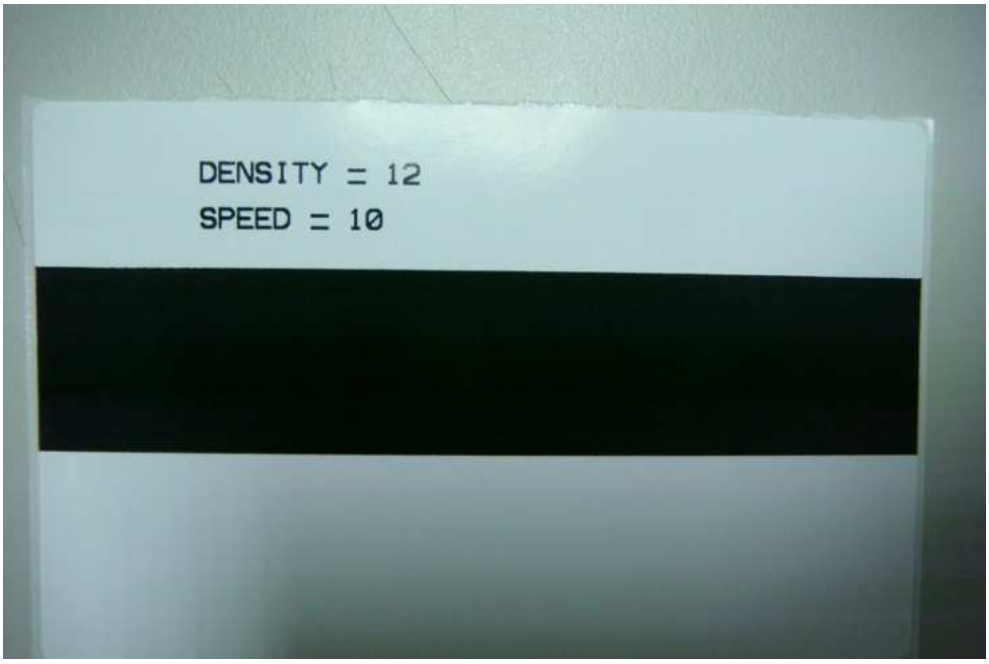
1. Release 2 lock screws before you start to adjusting heater line screws.



2. Adjust heater line by right-side and left-side heater-line adjusting screws.



3. In our standard testing procedure, we use Fasson semi-gloss paper and print a black bar as below picture.



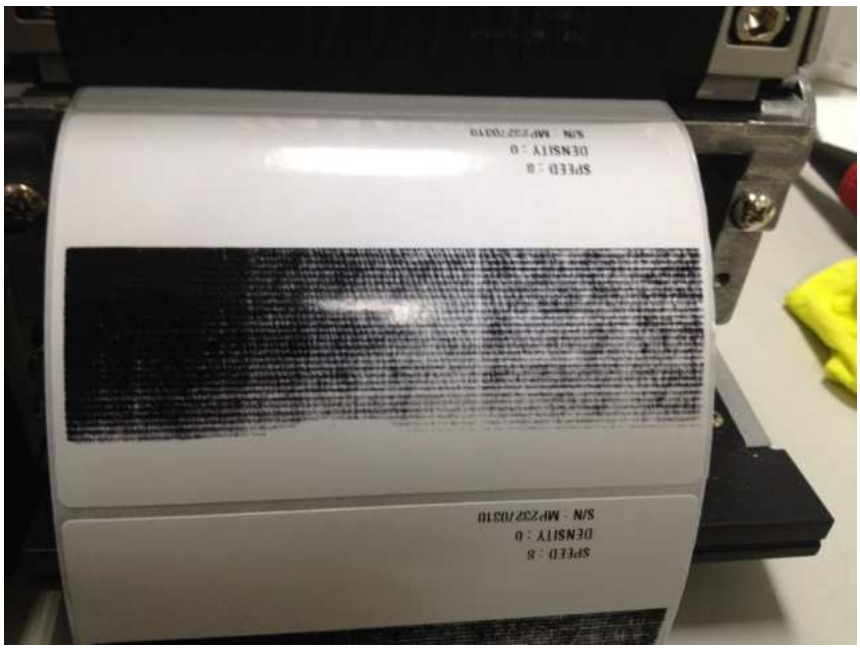
4. Please do not use too high density for adjusting heater line. Because it would not be easy seeing the uneven printing if using too high density to print the black bar.

For 200dpi printer, below is example command line for adjusting heater line.

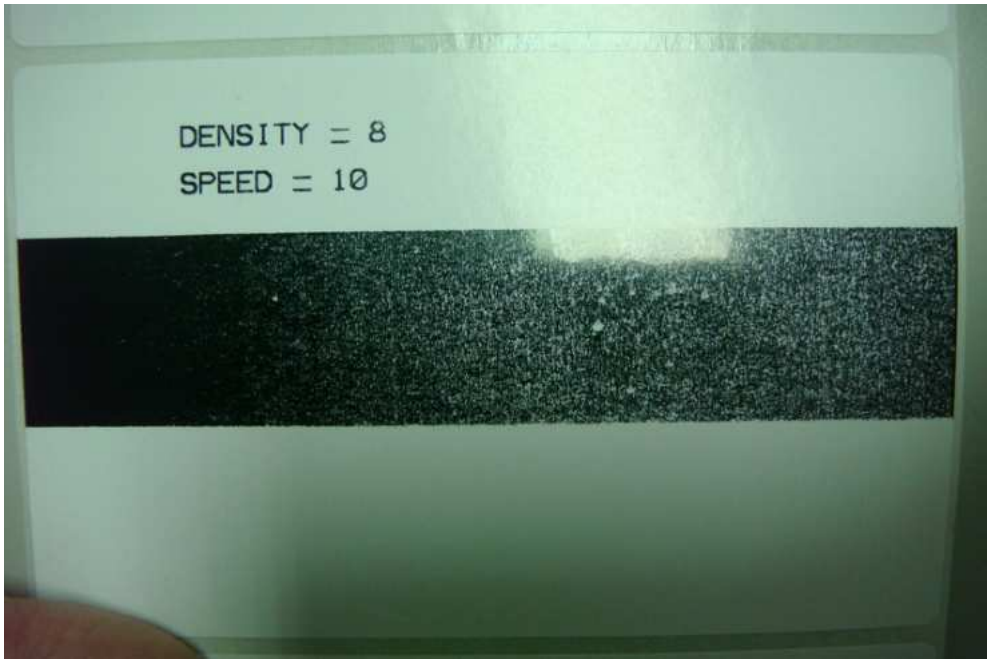
```
SIZE 102.5 mm, 63.5 mm
GAP 0.08,0
SPEED 8
DENSITY 0
REFERENCE 0,48
DIRECTION 0,0
SET TEAR ON
CLS
BAR 8,18,99*8,30*8
TEXT 142, 360, "ROMAN.TTF", 0, 8, 8, "SPEED : " +
GETSETTING$("CONFIG","TSPL","SPEED")
TEXT 142, 390, "ROMAN.TTF", 0, 8, 8, "DENSITY : " +
GETSETTING$("CONFIG","TSPL","DENSITY")
TEXT 142,420, "ROMAN.TTF",0,1,8,"S/N : " +
```

```
GETSETTING$("SYSTEM","INFORMATION","SERIAL")
PRINT 1
```

5. The lighter black bar may like left picture.



6. But sometime you can see one side has lighter density as below picture.



7. For this situation, please adjust right side heater line adjustment knob by clockwise direction until you see good density full average black.

Sometimes when right side is ok, left size may become a little white. In this time you may need to adjust left side knob.

8. Until both side is full-average black , like the first one picture.
   Or like left side picture.

9. If you keep turning the heater over the best position, it may look like below picture again:
   Right side is lighter again.

10. If this happens, please turn the heater line button in opposite direction. In the previous case, you may turn clockwise direction. Until you see the even picture I show you.
11. Then after adjusting it, lock the 2 locking screws to fix the heater line position.

Note:

- **For different thickness label, you may need to print out such pattern to see if this heater line is fit with this heat line position or not.**

- **If you find that even with the lowest speed and highest density, the density is still not enough, you can try to do this test to adjust heat line.**

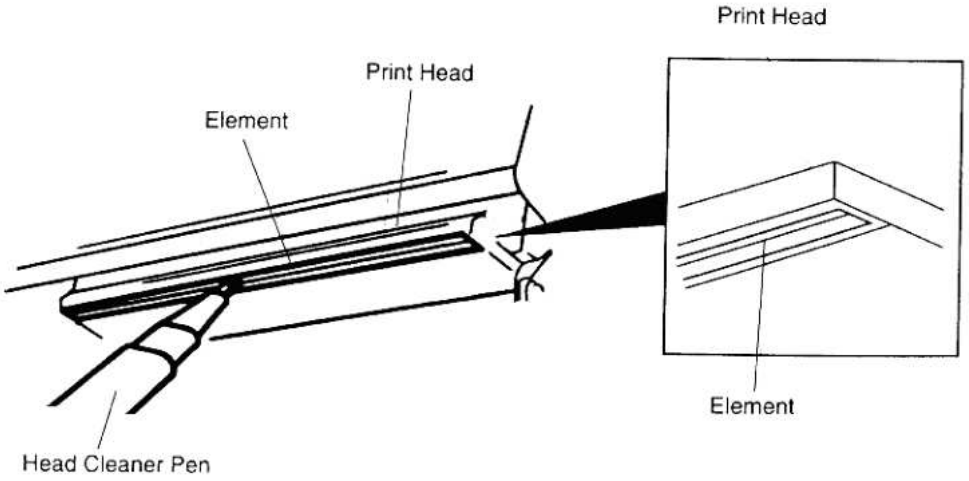
5. MAINTENANCE

This session presents the clean tools and methods to maintain your printer.

Please use one of following material to clean the printer.

- Cotton swab (Head cleaner pen)
- Lint-free cloth
- Vacuum / Blower brush
- 100% ethanol

2. The cleaning process is described as following

Printer Part	Method	Interval
Print Head	1. Always turn off the printer before cleaning the print head. 2. Allow the print head to cool for a minimum of one minute. 3. Use a cotton swab (Head cleaner pen) and 100% ethanol to clean the print head surface.	Clean the print head when changing a new ribbon roll
		
Platen Roller	1. Turn the power off. 2. Rotate the platen roller and wipe it thoroughly with a cotton swab, or lint-free cloth soaked with clean water..	Clean the platen roller when changing a new ribbon roll
Tear Bar/Peel	Use the lint-free cloth with 100%	As needed

Bar	ethanol to wipe it.	
Sensor	Compressed air blower or vacuum	Monthly
Exterior	Wipe it with water-dampened cloth	As needed
Interior	Brush or vacuum	As needed

Note:

- Do not touch printer head by bare hand. If you touch it careless, please use ethanol to clean it.
- Please use 100% Ethanol. DO NOT use medical alcohol, which may damage the printer head.
- Regularly clean the print head and supply sensors once change a new ribbon to keep printer performance and extend print head life.

UPDATE HISTORY

Date	Content	Editor
2019/1/4	- Modify GPIO information & update pictures - Add GPIO interface Pin configuration	Camille
2019/9/4	Modify section 2.1	Camille

TSC Auto ID Technology Co., Ltd.

Corporate Headquarters
9F., No.95, Minquan Rd., Xindian Dist.,
New Taipei City 23141, Taiwan (R.O.C.)
TEL: +886-2-2218-6789
FAX: +886-2-2218-5678
Web site: www.tscprinters.com
E-mail: apac_sales@tscprinters.com
tech_support@tscprinters.com

Li Ze Plant
No.35, Sec. 2, Ligong 1st Rd., Wujie Township,
Yilan County 26841, Taiwan (R.O.C.)
TEL: +886-3-990-6677
FAX: +886-3-990-5577