Mobile Barcode Printer

Alpha-30L(HC) Series

Direct Thermal

Series Model

Alpha-30L

Service Manual

www.tscprinters.com

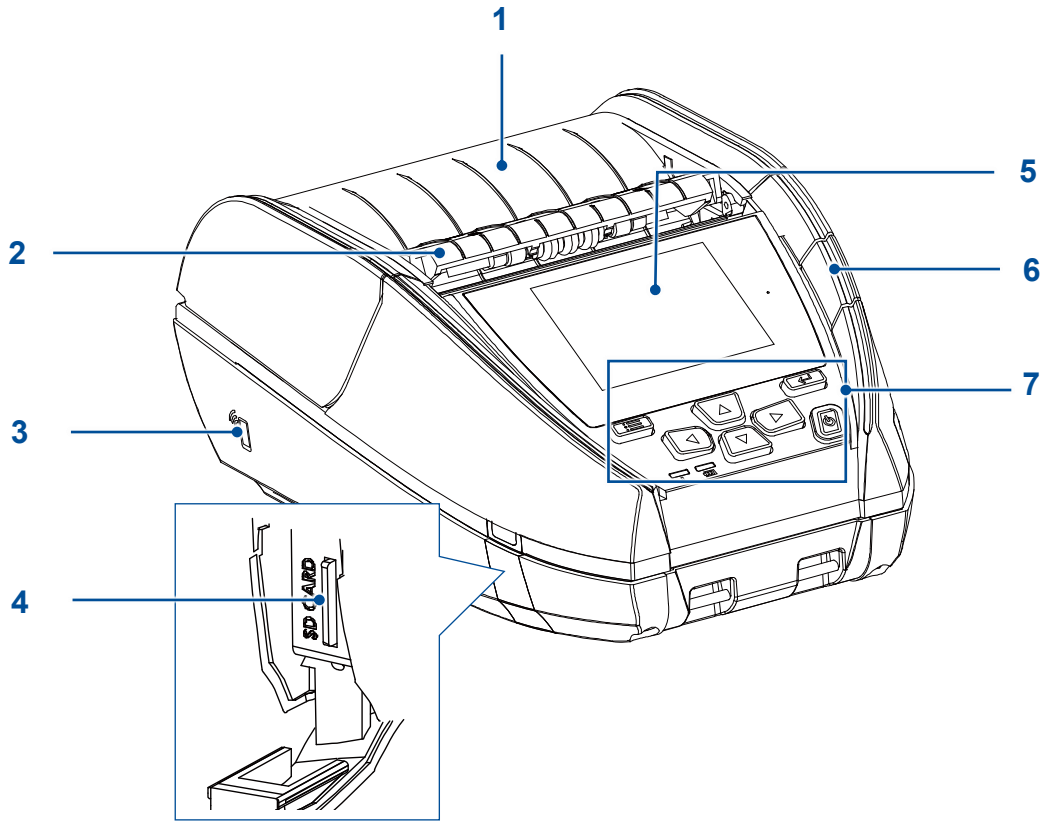
Copyright Information

Contents

1 Fundamental of the System

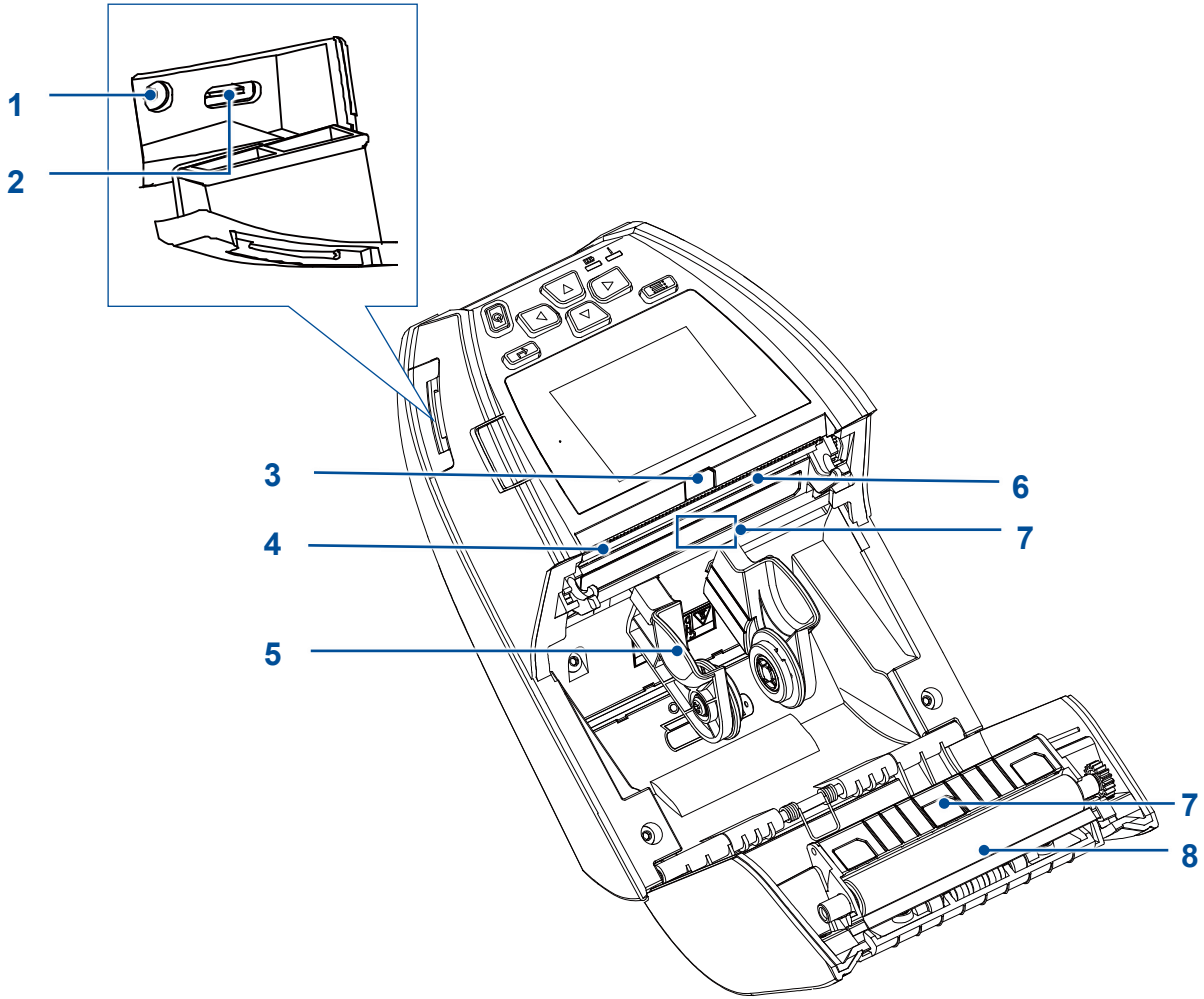
1.1 Printer Overview

Front View



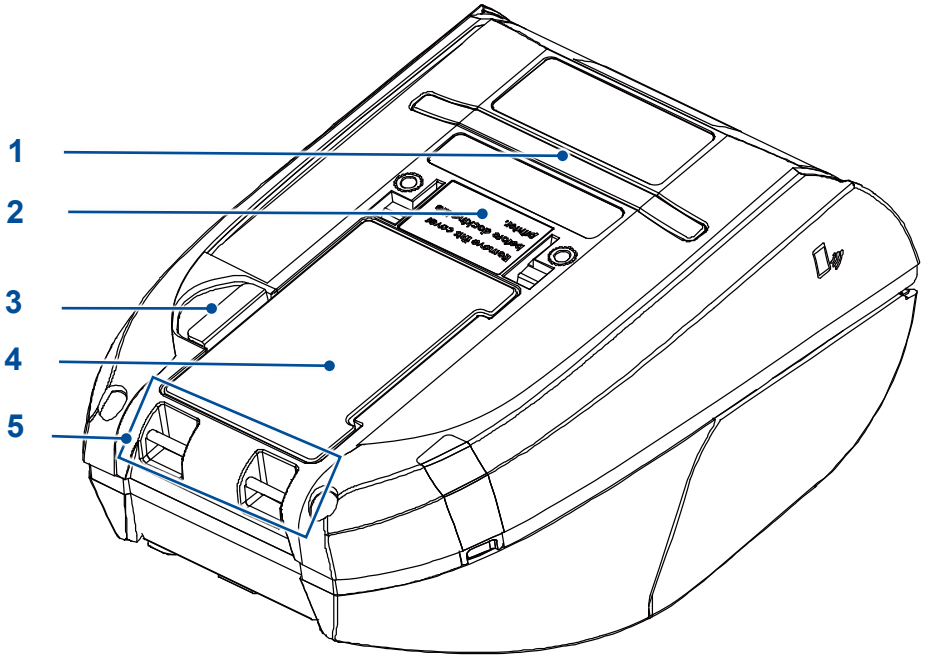
1. Media cover
2. Peeler module
3. NFC touch point
4. MicroSD card socket
5. LCD screen
6. Media cover release button
7. Buttons / LED indicators

Interior View



1. Power jack
2. Type C interface
3. Peeler sensor
4. Tear bar
5. Media holder
6. Printhead
7. Gap/Black mark sensors
8. Platen roller

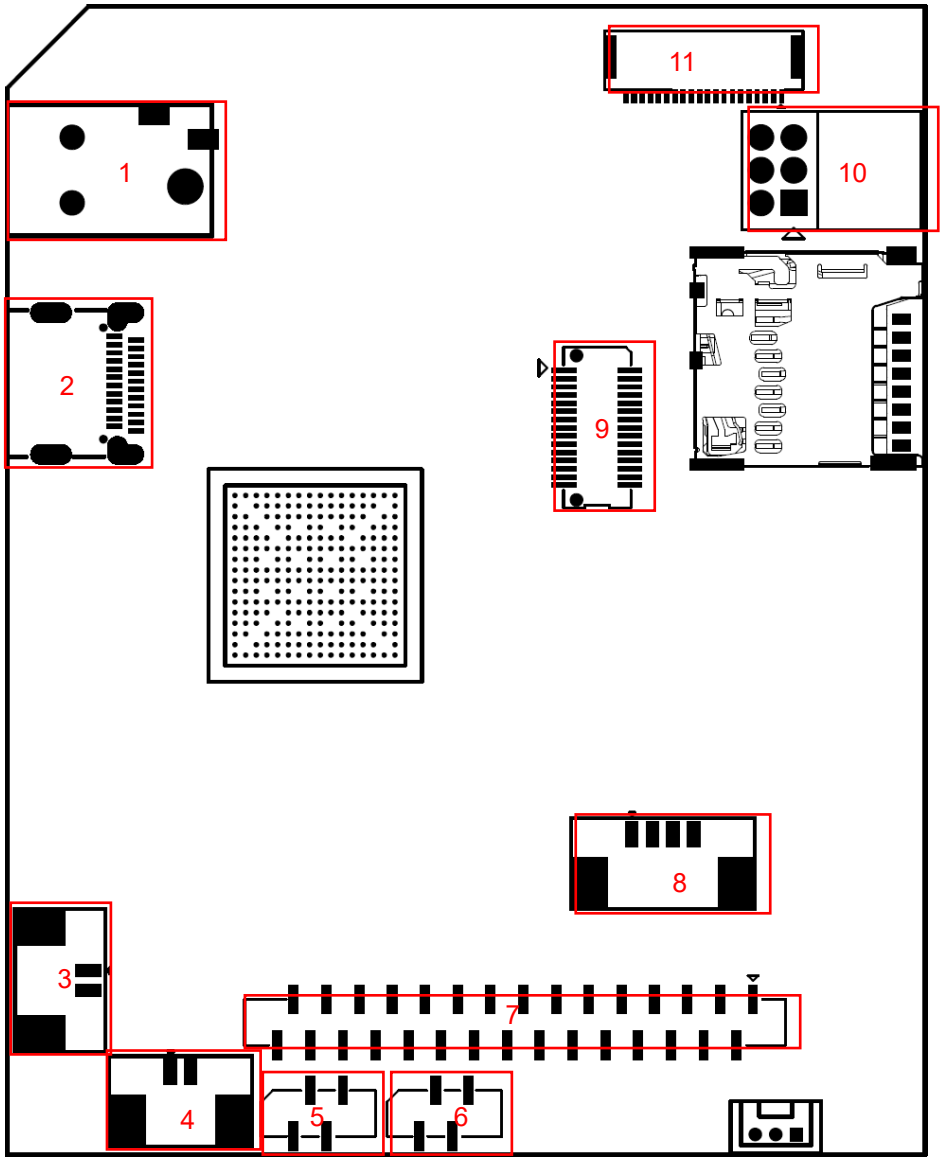
Rear View



1. External label entrance chute
2. Charging position for docking cradle
3. Battery open clasp
4. Li-ion battery
5. Installation location for belt clip

2 Electronics

2.1 Summary of the Board Connectors



<table>
<tr><th>Connector</th><th>Description</th><th>Remark</th></tr>
<tr><td rowspan="2">1</td><td colspan="2">Power supply output (12V/2A DC) connector</td><td>DCIN1</td></tr>
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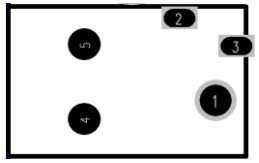

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<tr><th>Pin</th><th>Description</th></tr>
<tr><td>1</td><td>12V</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><td>3</td><td>GND</td></tr>
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<tr><td rowspan="2">2</td><td colspan="2">USB Device connector</td><td>CON2</td></tr>
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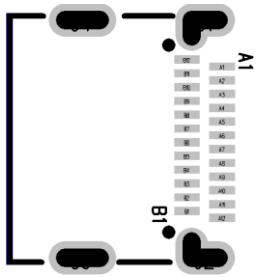

<table>
<tr><th>Pin</th><th>Description</th></tr>
<tr><td>A1</td><td>GND</td></tr>
<tr><td>A5</td><td>Pull-down resistor 5.1K</td></tr>
<tr><td>A6</td><td>D+</td></tr>
<tr><td>A7</td><td>D-</td></tr>
<tr><td>A12</td><td>GND</td></tr>
<tr><td>B1</td><td>GND</td></tr>
<tr><td>B5</td><td>Pull-down resistor 5.1K</td></tr>
<tr><td>B6</td><td>D+</td></tr>
<tr><td>B7</td><td>D-</td></tr>
<tr><td>B12</td><td>GND</td></tr>
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</td></tr>
<tr><td rowspan="2">3</td><td colspan="2">Head open connector</td><td>CON10</td></tr>
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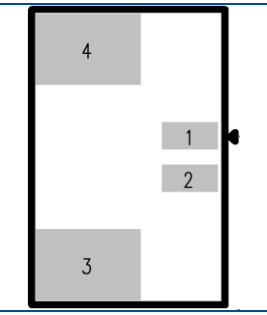

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<tr><th>Pin</th><th>Description</th></tr>
<tr><td>1</td><td>GND</td></tr>
<tr><td>2</td><td>Head open sensor receiver</td></tr>
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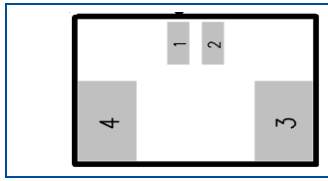
<table>
<tr><th>Connector</th><th>Description</th><th>Remark</th></tr>
<tr><td rowspan="2">4</td><td colspan="2">RTC battery connector</td><td>CON18</td></tr>
<tr><td colspan="3"> 

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<tr><td>1</td><td>GND</td></tr>
<tr><td>2</td><td>3V</td></tr>
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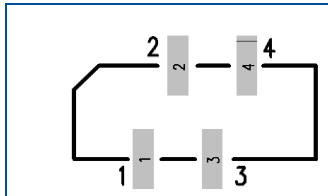
<tr><td rowspan="2">5</td><td colspan="2">Black mark sensor connector (Roll side)</td><td>CON7</td></tr>
<tr><td colspan="3"> 

<table>
<tr><th>Pin</th><th>Description</th></tr>
<tr><td>1</td><td>Black mark sensor emitter</td></tr>
<tr><td>2</td><td>Black mark sensor receiver</td></tr>
<tr><td>3</td><td>3.3V</td></tr>
<tr><td>4</td><td>GND</td></tr>
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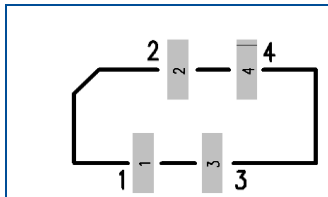
<tr><td rowspan="2">6</td><td colspan="2">Black mark sensor connector (TPH side)</td><td>CON8</td></tr>
<tr><td colspan="3"> 

<table>
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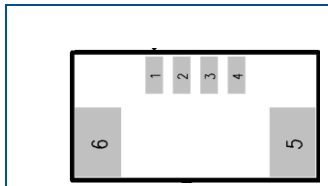
<tr><td>1</td><td>3.3V</td></tr>
<tr><td>2</td><td>Black mark sensor emitter</td></tr>
<tr><td>3</td><td>Black mark sensor receiver</td></tr>
<tr><td>4</td><td>3.3V</td></tr>
</table></td></tr>
<tr><td>7</td><td colspan="2">Print head connector</td><td>CON13</td></tr>
<tr><td rowspan="2">8</td><td colspan="2">Motor connector</td><td>CON14</td></tr>
<tr><td colspan="3"> 

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<tr><td>2</td><td>A-</td></tr>
<tr><td>3</td><td>B-</td></tr>
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<table>
<tr><th>Connector</th><th>Description</th><th>Remark</th></tr>
<tr><td>9</td><td>Wi-Fi/Bluetooth module connector</td><td>CON4</td></tr>
<tr><td rowspan="2">10</td><td>RFID Module connector</td><td>CON12</td></tr>
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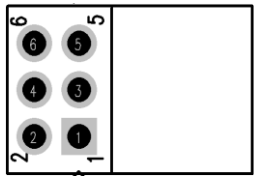
<table>
<tr><th>Pin</th><th>Description</th></tr>
<tr><td>1</td><td>Enable</td></tr>
<tr><td>2</td><td>Reset</td></tr>
<tr><td>3</td><td>UART-RXD</td></tr>
<tr><td>4</td><td>UART-TXD</td></tr>
<tr><td>5</td><td>GND</td></tr>
<tr><td>6</td><td>12V</td></tr>
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</td></tr>
<tr><td>11</td><td>Panel/Key board connector</td><td>CON3</td></tr>
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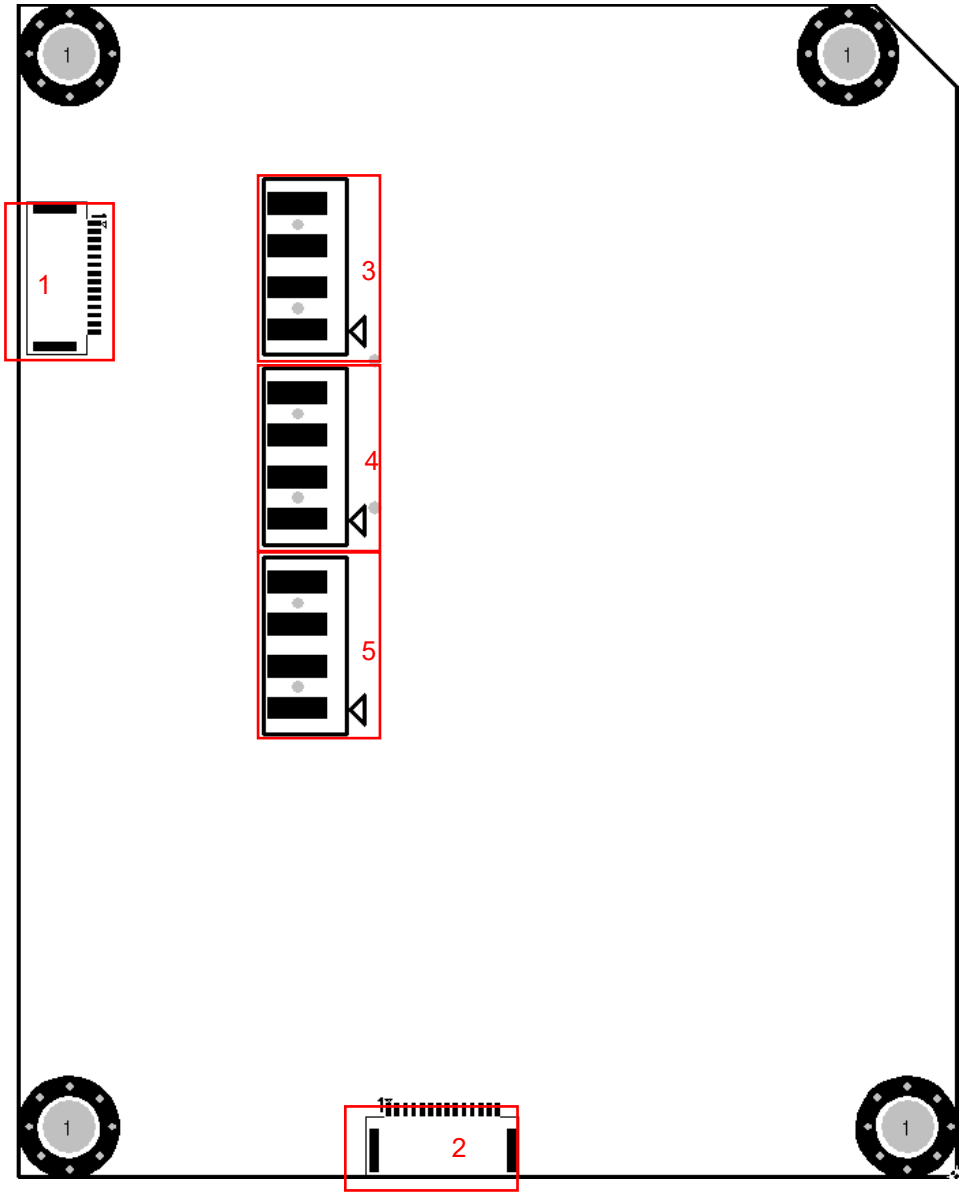
Main board bottom



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<tr><th>Connector</th><th>Description</th><th>Remark</th></tr>
<tr><td>1</td><td>Micro SD FPC connector</td><td>CON9</td></tr>
<tr><td rowspan="2">2</td><td>Cradle adapter board connector</td><td>CON5</td></tr>
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<tr><td>2</td><td>12V</td></tr>
<tr><td>3</td><td>12V</td></tr>
<tr><td>4</td><td>12V</td></tr>
<tr><td>5</td><td>12V</td></tr>
<tr><td>6</td><td>12V</td></tr>
<tr><td>7</td><td>NC</td></tr>
<tr><td>8</td><td>NC</td></tr>
<tr><td>9</td><td>GND</td></tr>
<tr><td>10</td><td>GND</td></tr>
<tr><td>11</td><td>GND</td></tr>
<tr><td>12</td><td>GND</td></tr>
<tr><td>13</td><td>GND</td></tr>
<tr><td>14</td><td>GND</td></tr>
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<tr><td rowspan="2">3</td><td>Battery connector</td><td>CON15</td></tr>
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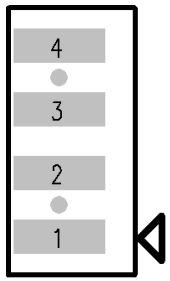

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<tr><td>2</td><td>NTC</td></tr>
<tr><td>3</td><td>Battery positive</td></tr>
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<tr><td rowspan="2">4</td><td colspan="2">Battery connector</td><td>CON16</td></tr>
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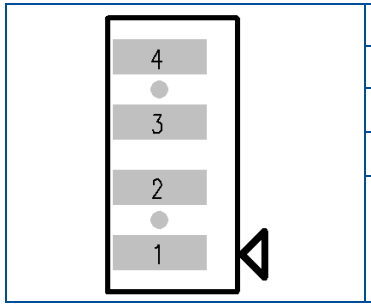

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<tr><td>3</td><td>I2C-SCL</td></tr>
<tr><td>4</td><td>I2C-SDA</td></tr>
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<tr><td rowspan="2">5</td><td colspan="2">Battery connector</td><td>CON17</td></tr>
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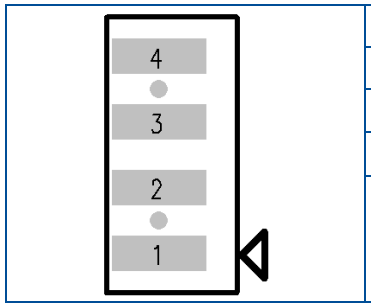

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<tr><td>1</td><td>Battery positive</td></tr>
<tr><td>2</td><td>Battery positive</td></tr>
<tr><td>3</td><td>GND</td></tr>
<tr><td>4</td><td>GND</td></tr>
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</td></tr>
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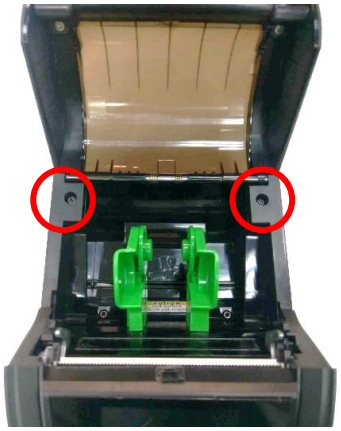
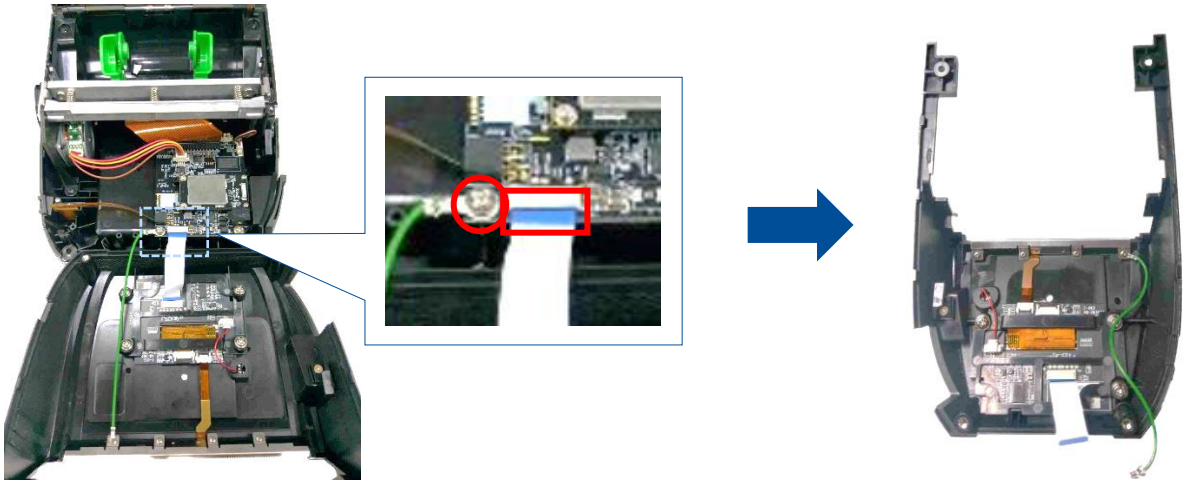
3 Mechanism

3.1 Replacing the Printer Top Cover (with Keys Control Board)

1. Remove 4 screws as indicated.



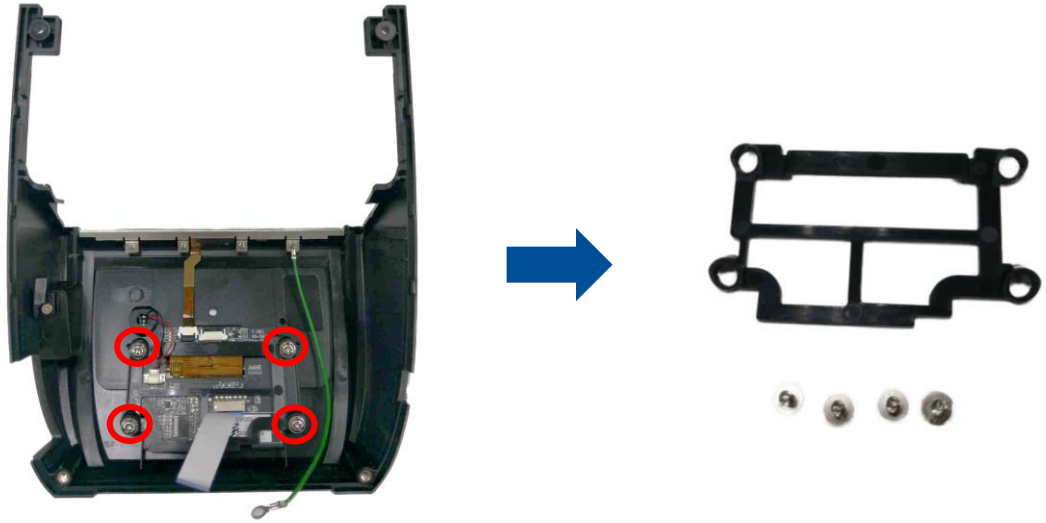
2. Remove the cable and unscrew 1 screw to take out the printer top cover (with keys control board).



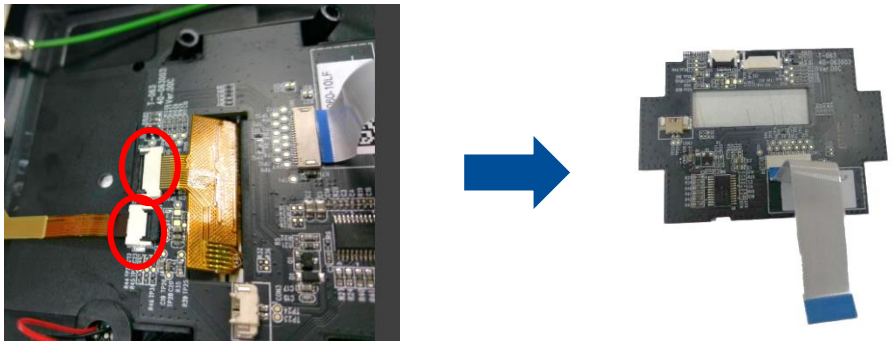
3. Reassemble the parts in the reverse procedures.

3.2 Replacing the Keys Control Board

1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove printer top cover.
2. Disconnect the cable and unscrew the 4 screws as shown.



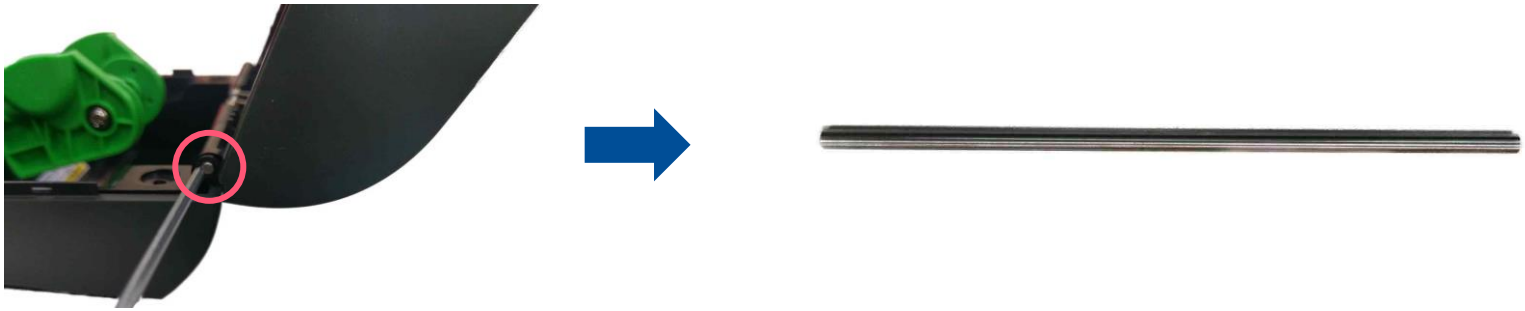
3. Disconnect the remain 2 cables and take out the LCD board



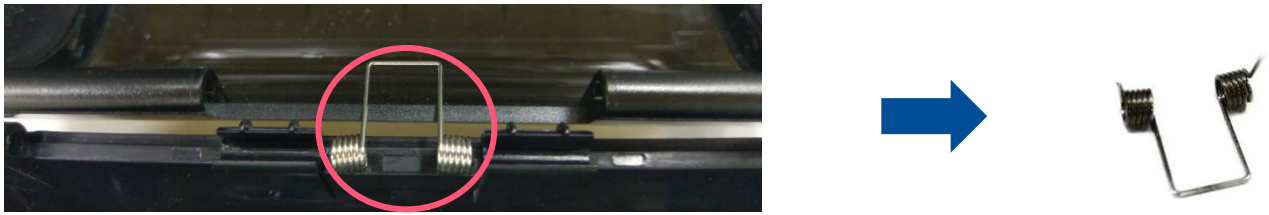
4. Reassemble the parts in the reverse procedures.

3.3 Replacing the Shaft and the Torsion Spring

1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove printer top cover.
2. Use tool to push the shaft out.



3. Take out the spring from the hole as shown.

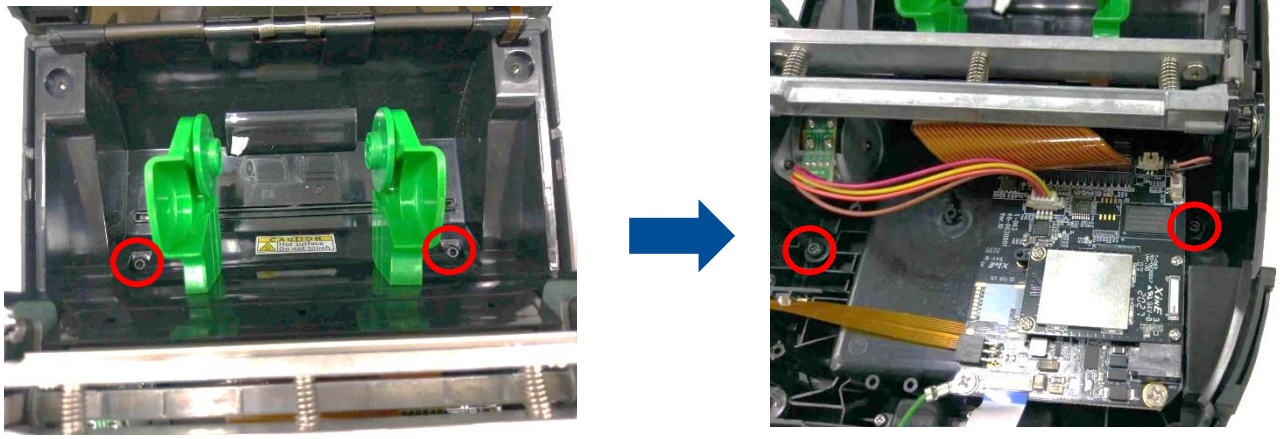


4. Reassemble the parts in reverse procedure.

3.4 Replacing the Media Cover

For GPIO & Parallel Board:

1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove the top cover and Refer to 3.3 Replacing the Shaft and the Torsion Spring to remove the shaft and torsion spring.
2. Unscrew 4 marked screws.

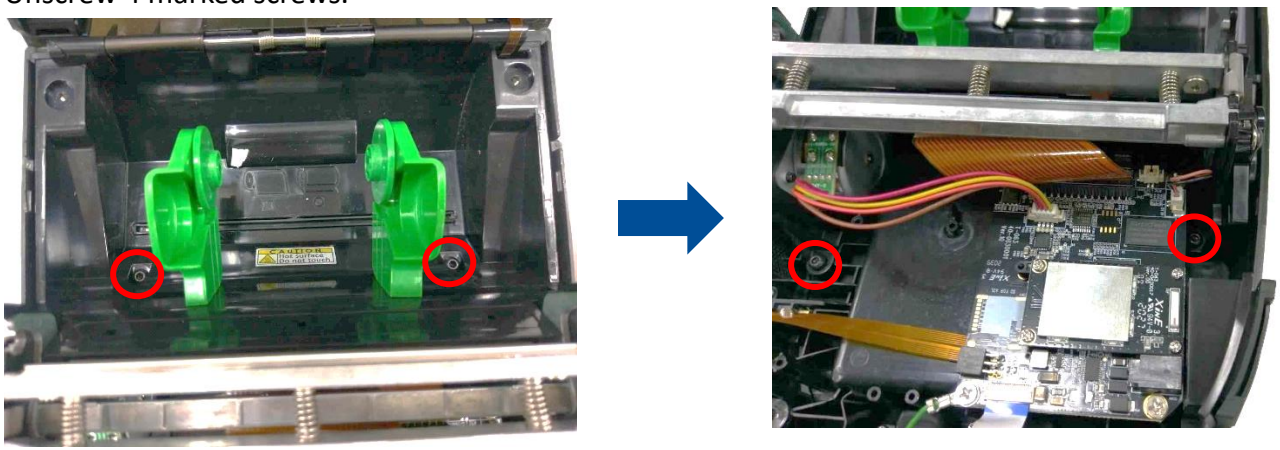


3. Disconnect the cable from the board as shown, separate the media holder.

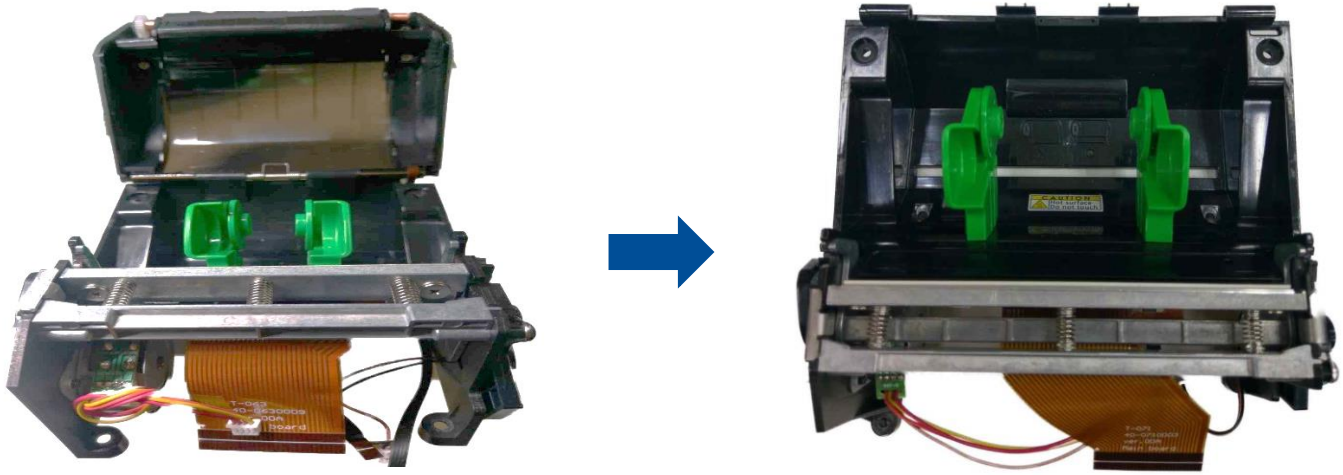
4. Reassemble the parts in reverse procedures.

3.5 Replacing the Media Holder

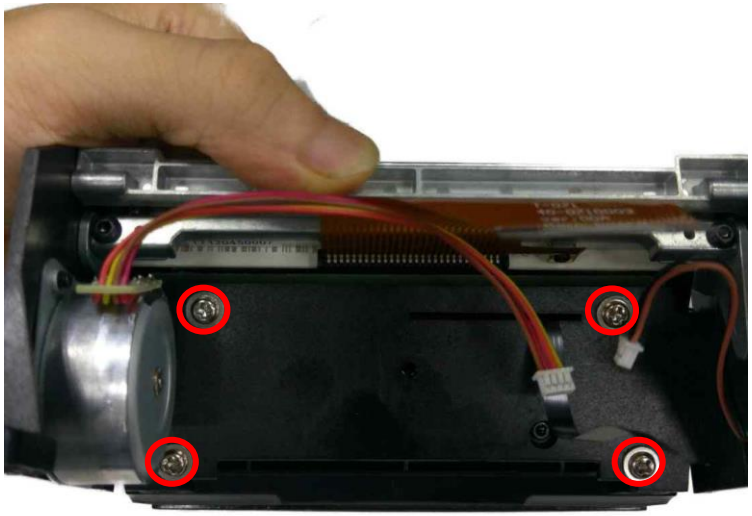
1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove the top cover.
2. Unscrew 4 marked screws.



3. Disconnect the cables from the main board and take it out.
4. Refer to 3.4 Replacing the Media Cover to remove the media cover.



5. Flip to back side and unscrew 4 screws as shown to replace the media holder.

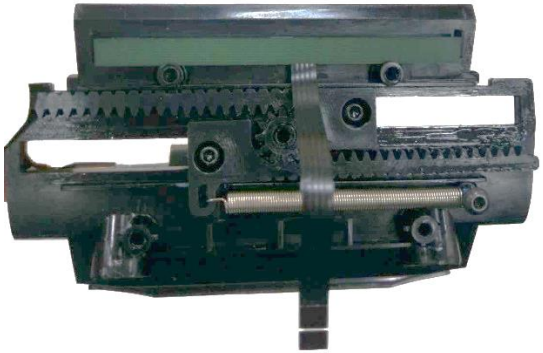


6. Reassemble the parts in the reverse procedures.

3.6 Replacing the Black Mark Sensor

1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove the top cover and refer to 3.5 Replacing the Media Holder to remove the media holder.

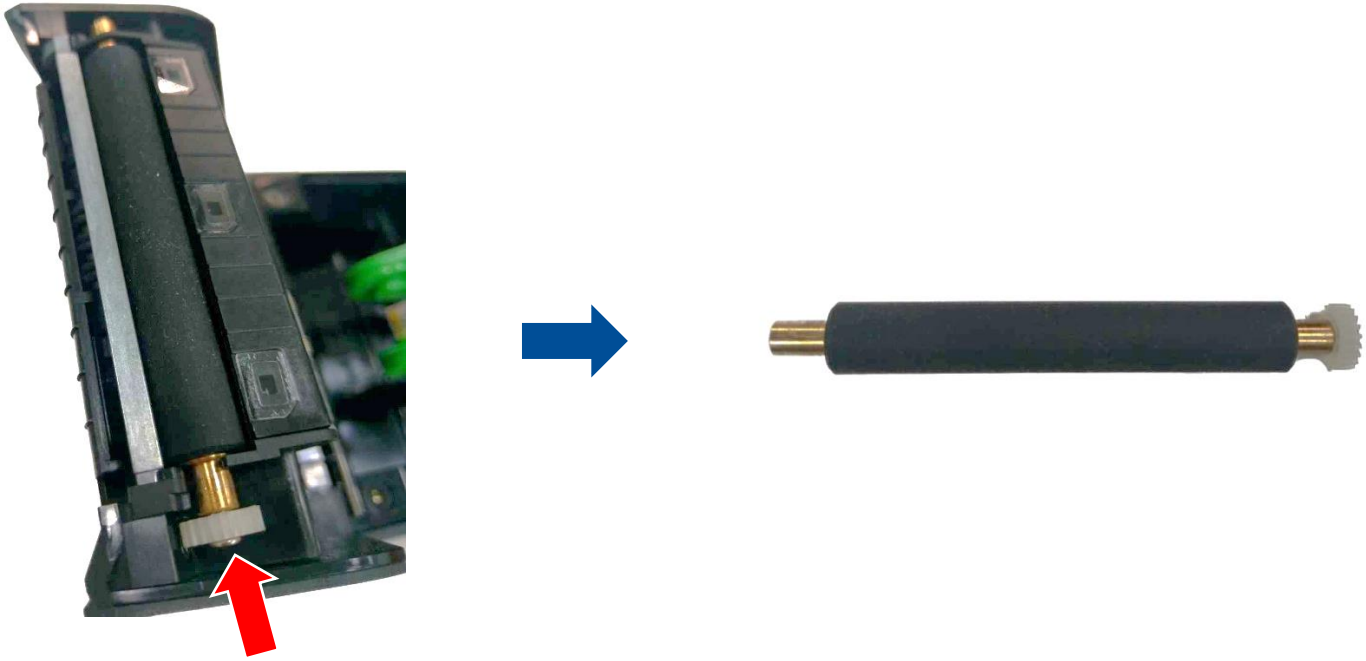
2. Replacing the black mark sensor by taking it out from the slot as shown.



3. Reassemble the parts in reverse procedures.

3.7 Replacing the Platen Roller

1. Open the printer cover by pressing the media release button.
2. Take out the platen roller by lifting and pulling (pry it up) the direction as shown.



3. Reassemble the parts in reverse procedures.

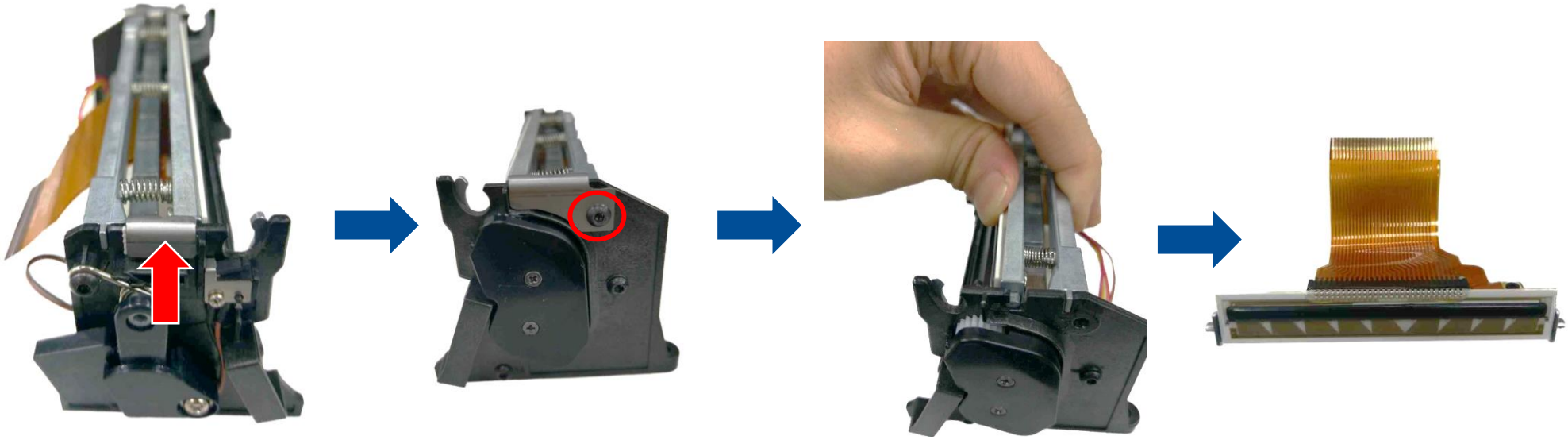
3.8 Replacing the Print Module Assembly

1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove the top cover and refer to 3.5 Replacing the Media Holder to remove the media holder.
2. Separate the Print Module.

3. Reassemble the parts in reverse procedures.

3.9 Replacing the Print Head

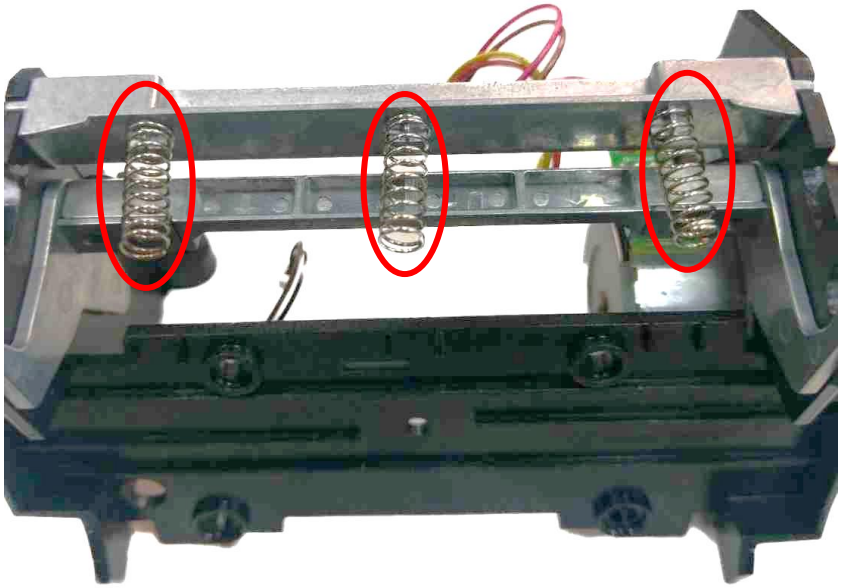
1. Refer to 3.8 Replacing the Print Module Assembly to remove the media holder and separate the print module.
2. Take off the iron lid on the left side and unscrew 1 screw to take off the iron lid on right side.
3. Squeeze to take out the print head.



4. Reassemble the part in reverse procedures.

3.10 Replacing the Print Head Spring

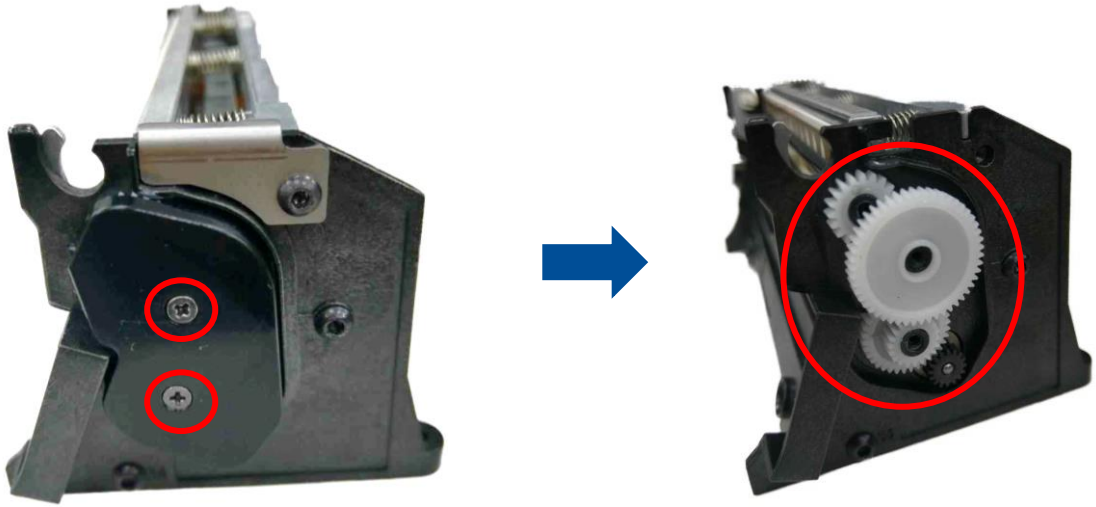
1. Refer to 3.9 Replacing the Print Head to remove the print head.
2. Replacing the spring by pulling it out.



3. Reassemble the part in reverse procedure

3.11 Replacing the Gears

1. Refer to 3.8 Replacing the Print Module Assembly to take out the print module.
2. Unscrew 2 marked screws. Replace the gears.



3. Reassemble the parts in reverse procedures.

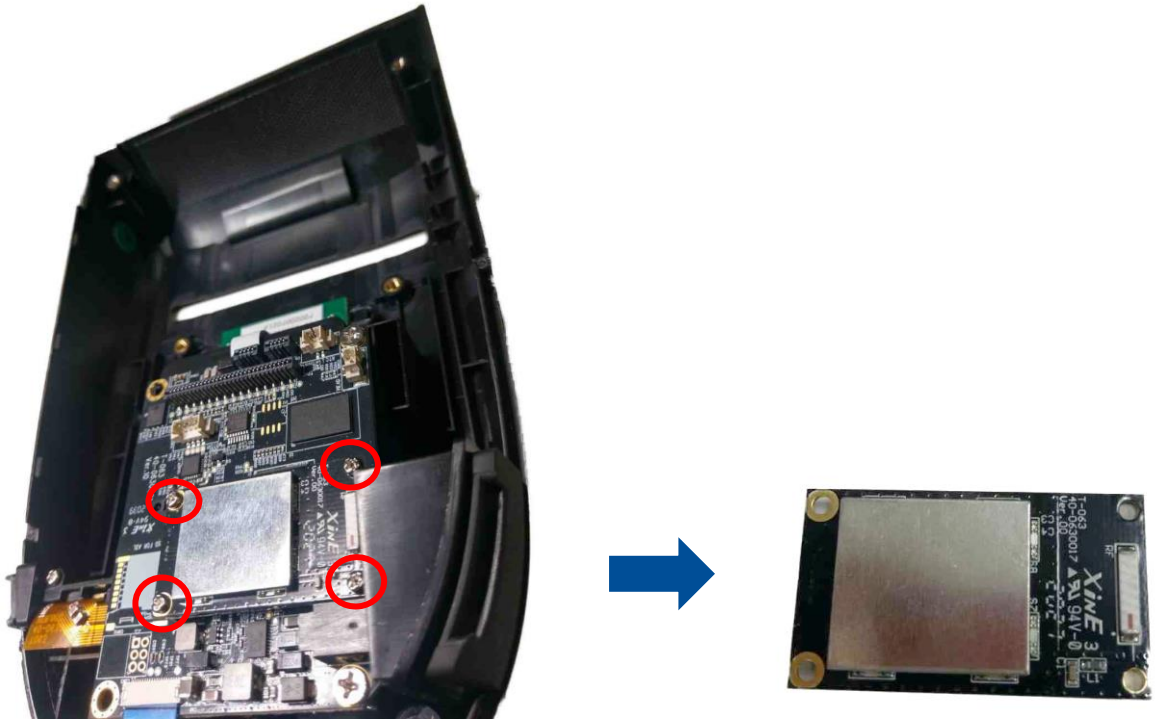
3.12 Replacing the Motor Assembly

1. Refer to 3.8 Replacing the Print Module Assembly to take out the print module.
2. Unscrew 2 screws as shown.

3. Reverse the parts in reverse procedures.

3.13 Replacing the Bluetooth Module

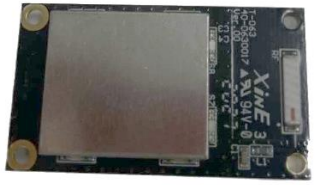
1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove the top cover and refer to 3.5 Replacing the Media Holder to remove the media holder.
2. Refer to 3.8 Replacing the Print Module Assembly to take out the print module.
3. Unscrew 4 screws to remove Bluetooth module.



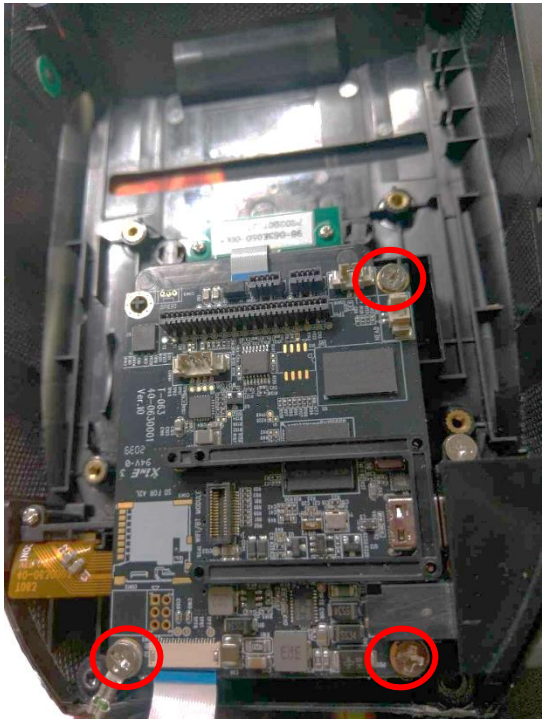
4. Reassemble the parts in reverse procedure.

3.14 Replacing the Main Board Assembly

1. Refer to 3.13 Replacing the Bluetooth Module to remove the Bluetooth module.



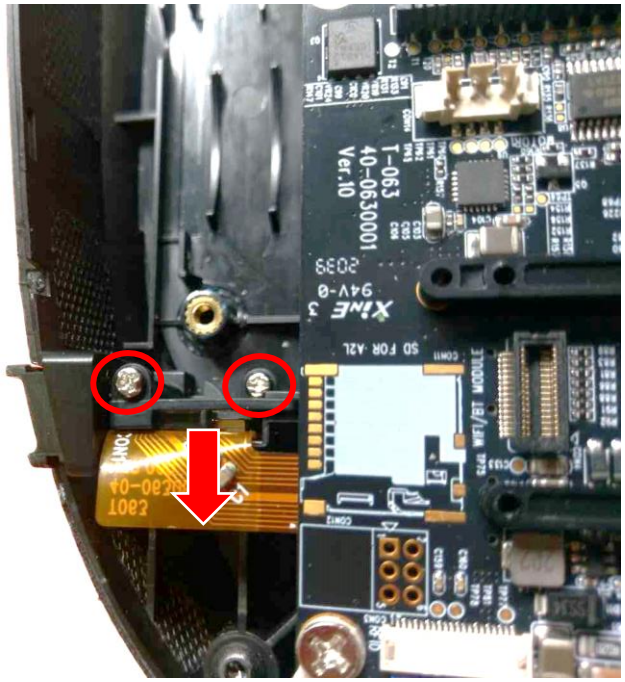
2. Disconnect the remaining cables and unscrew 3 marked screws to replace the main board.



3. Reassemble the parts in reverse procedures.

3.15 Replacing the MicroSD FPCB and the MicroSD Holder

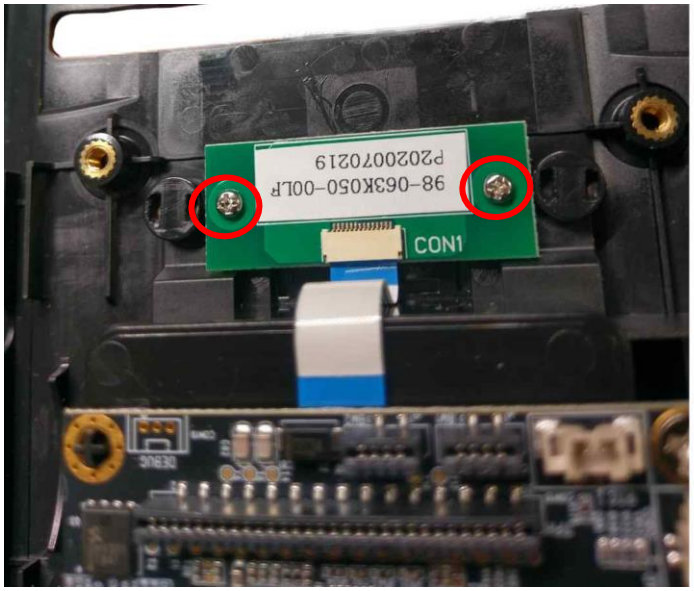
1. Refer to 3.8 Replacing the Print Module Assembly to take out the print module.
2. Disconnect the cable and unscrew 2 marked screw as shown.



3. Reassemble the parts in reverse procedures

3.16 Replacing the Cradle Charge Adapter Board

1. Refer to 3.8 Replacing the Print Module Assembly to take out the print module.
2. Disconnect the cable and unscrew 2 marked screws as shown.



3. Reassemble the parts in the reverse procedures.

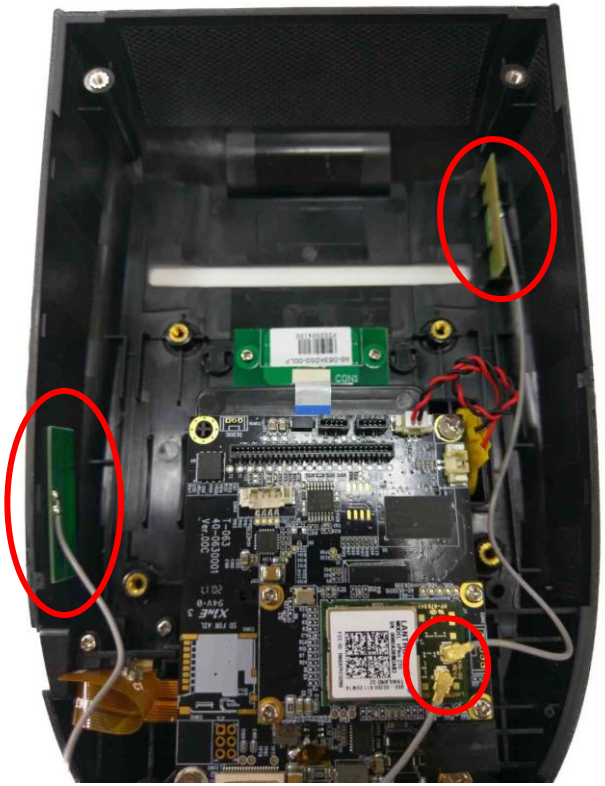
3.17 Replacing the Lower Cover

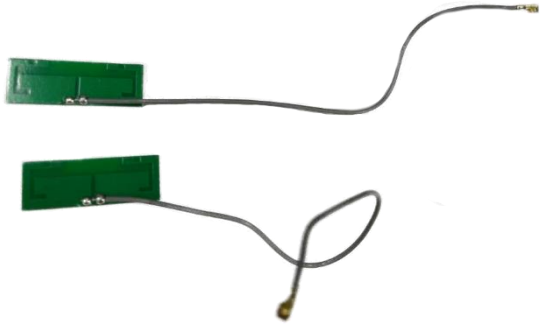
1. Refer to 3.14 Replacing the Main Board Assembly to remove the main board.
2. Refer to 3.15 Replacing the MicroSD FPCB and the MicroSD Holder to remove MicroSD FPCB and holder.
3. Refer 3.16 Replacing the Cradle Charge Adapter Board to remove cradle charge adapter board.

4. Reassemble the parts in reverse procedure.

3.18 Replacing the Antenna PCB

1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to open top cover.
2. Refer to 3.5 Replacing the Media Holder to lift the media holder.
3. Unplug the Antenna PCB and cable from the WiFi PCB

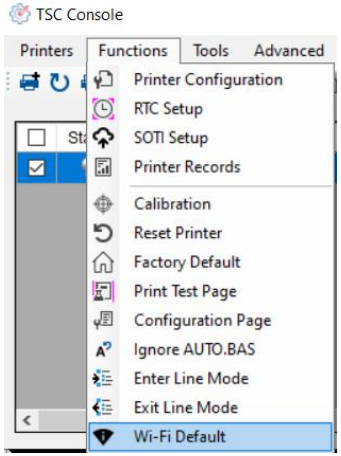




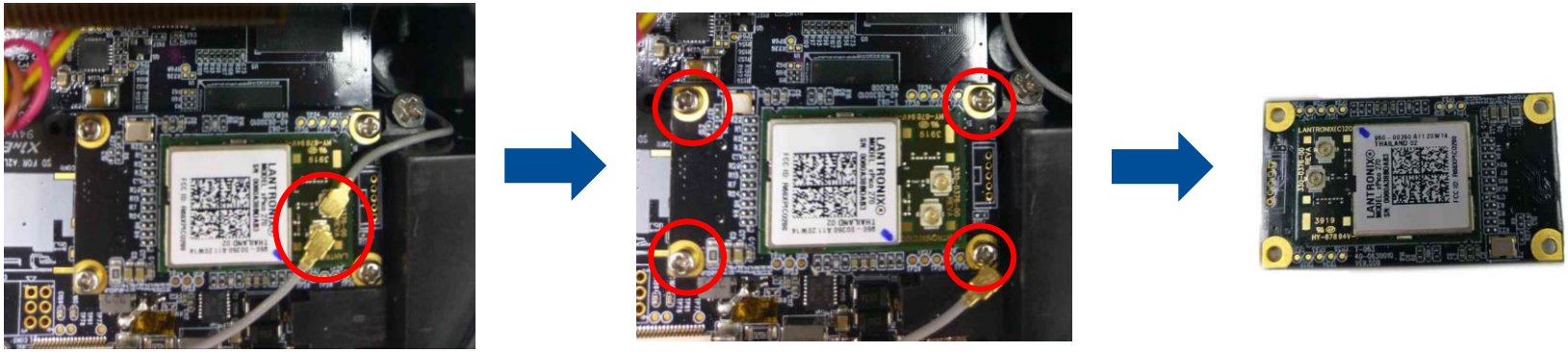
4. Reassemble the parts in reverse procedures.

3.19 Replacing the Wi-Fi Module

※ Before replacing the new Wi-Fi module, please set the default to clear the old Wi-Fi settings in the printer via TSC Console. And you need to reset the Wi-Fi settings after replacing the new Wi-Fi module.



1. Refer to 3.1 Replacing the Printer Top Cover (with Keys Control Board) to remove the top cover.
2. Unplug the cable of Antenna PCB. Unscrew 4 marked screws.



3. Reassemble the parts in reverse procedures.

4 Troubleshooting

Problem	Possible Cause	Recovery Procedure
No Power	* The battery is not properly installed. * Battery out of power. * Battery damage.	* Reinstall the battery. * Switch the printer on. * Charge the battery. * Replace a new battery.
Not Printing	* Check if interface cable is well connected to the interface connector. * Check if wireless or Bluetooth device is well connected between host and printer. * The port specified in the Windows driver is not correct.	* Re-connect cable to interface change a new cable. * Please reset the wireless device setting. * Select the correct printer port in the driver. * 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.
No print on the label	* Label loaded not correctly * Use wrong type paper	* Follow the instructions in loading the media. * Use thermal type paper
The printer status from LCD shows “Carriage Open”.	* The printer carriage is open.	* Please close the print carriage.
The printer status from LCD shows “No Paper”.	* Running out of media roll. * The media is installed incorrectly. * Media sensor is not calibrated.	* Supply a new media roll. * Follow the instructions in loading the media to reinstall the media roll. * Calibrate the media sensor.
The printer status from LCD shows “Paper Jam”.	* Media sensor is not set properly. * The media size is set incorrectly. * Label may be stuck inside the printer mechanism.	* Calibrate the media sensor. (Select the correct sensor) * Set media size correctly. * Remove the stuck label inside the printer mechanism.
Take Label	* Peel function is enabled.	* If use peel-off mode, please remove the label.
Can’t downloading the file to memory (FLASH / DRAM/ CARD)	* The space of memory is full.	* Delete unused files in the memory.
SD card is unable to use	* SD card is damaged. * SD card doesn’t insert correctly.	* Use the supported capacity SD card. * Insert the SD card again.

Poor Print Quality	* Media is loaded incorrectly * Dust or adhesive accumulation on the print head. * Print density is not set properly. * Print speed is not set properly. * Print head element is damaged.	* 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 media roll. * Make sure the print carriage is closed properly.
Missing printing on the left or right side of label	* Wrong label size setup.	* Set the correct label size.
Irregular printing	* The printer is in Hex Dump mode.	* Turn off and on the printer to skip the dump mode.
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 sensor by blower.
RTC time is incorrect when reboot the printer	* The battery has run down.	* Check if there is a battery on the main board.

5 Maintenance

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

- **For Cleaning**

  Depending on the media used, the printer may accumulate residues (media dust, adhesives, etc.) as a by-product of normal printing. To maintain the best printing quality, you should remove these residues by cleaning the printer periodically. Regularly clean the print head and supply sensors once change a new media to keep the printer at the optimized performance and extend printer life.

- **For Disinfecting**

  Sanitize your printer to protect yourself and others and can help prevent the spread of viruses.

- **Important**

  - Set the printer power switch to O (Off) prior to performing any cleaning or disinfecting tasks. Leave the power cord connected to keep the printer grounded and to reduce the risk of electrostatic damage.
  - Do not wear rings or other metallic objects while cleaning any interior area of the printer.
  - Use only the cleaning agents recommended in this document. Use of other agents may damage the printer and void its warranty.
  - Do not spray or drip liquid cleaning solutions directly into the printer. Apply the solution on a clean lint-free cloth and then apply the dampened cloth to the printer.
  - Do not use canned air in the interior of the printer as it can blow dust and debris onto sensors and other critical components.
  - Only use a vacuum cleaner with a nozzle and hose that are conductive and grounded to drain off static build up.
  - All reference in these procedures for use of isopropyl alcohol requires that a 99% or greater isopropyl alcohol content be used to reduce the risk of moisture corrosion to the printhead.
  - Do not touch printhead by hand. If you touch it careless, please use 99% Isopropyl alcohol to clean it.
  - Always taking personal precaution when using any cleaning agent.

Cleaning Tools

- Cotton swab
- Lint-free cloth
- Brush with soft non-metallic bristles
- Vacuum cleaner
- 75% Ethanol (for disinfecting)
- 99% Isopropyl alcohol (for printhead and platen roller cleaning)
- Genuine printhead cleaning pen
- Mild detergent (without chlorine)

Cleaning Process:

Printer Part	Method	Interval
Print Head	**I.** Always turn off the printer before cleaning the printhead. **II.** Allow the printhead to cool for at least one minute. **III.** Use a cotton swab and 99% Isopropyl Alcohol or genuine print head cleaning pen to clean the print head surface.	Clean the print head when changing a new label roll.
Platen Roller	**I.** Turn off the printer. **II.** Rotate the platen roller and wipe it thoroughly with the lint-free 99% Isopropyl Alcohol.	Clean the platen roller when changing a new label roll
Peel Bar	Use the lint-free cloth with 99% Isopropyl Alcohol to wipe it.	As needed
Sensor	Use brush with soft non-metallic bristles or a vacuum cleaner, to remove paper dust. Clean upper and lower media sensors to ensure reliable Top of Form and Paper Out sensing.	Monthly
Exterior	Clean the exterior surfaces with a clean, lint-free cloth (water-dampened cloth). If necessary, use a mild detergent or desktop cleaning solution then use the 75% Ethanol to wipe it.	As needed
Interior	Clean the interior of the printer by removing any dirt and lint with a vacuum cleaner, as described above, or use a brush with soft non-metallic bristles then use the 75% Ethanol to wipe it.	As needed

Revision History

Date	Content	Editor
2023/12/8	Add Alpha-30L Healthcare	Camille

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