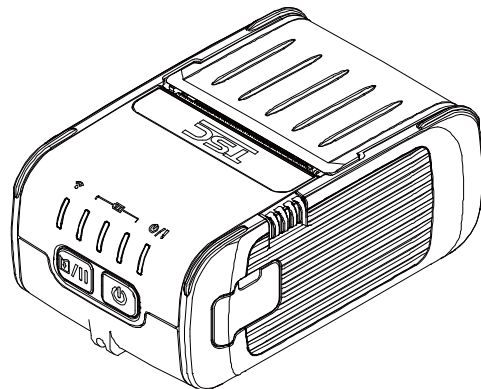


## Alpha-2R

### Direct Thermal Portable Printer

## SERVICE MANUAL



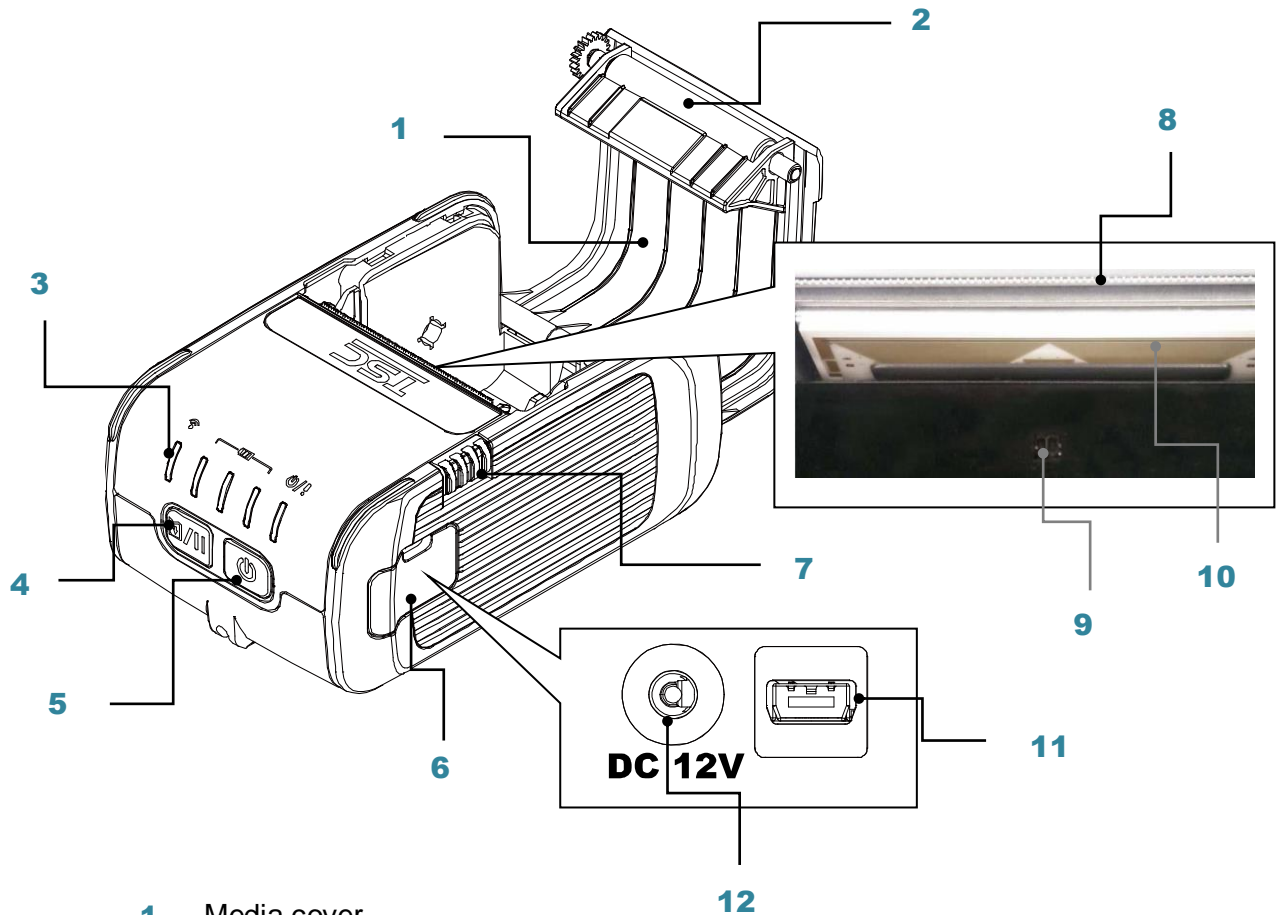
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# 1. FUNDAMENTAL OF THE SYSTEM

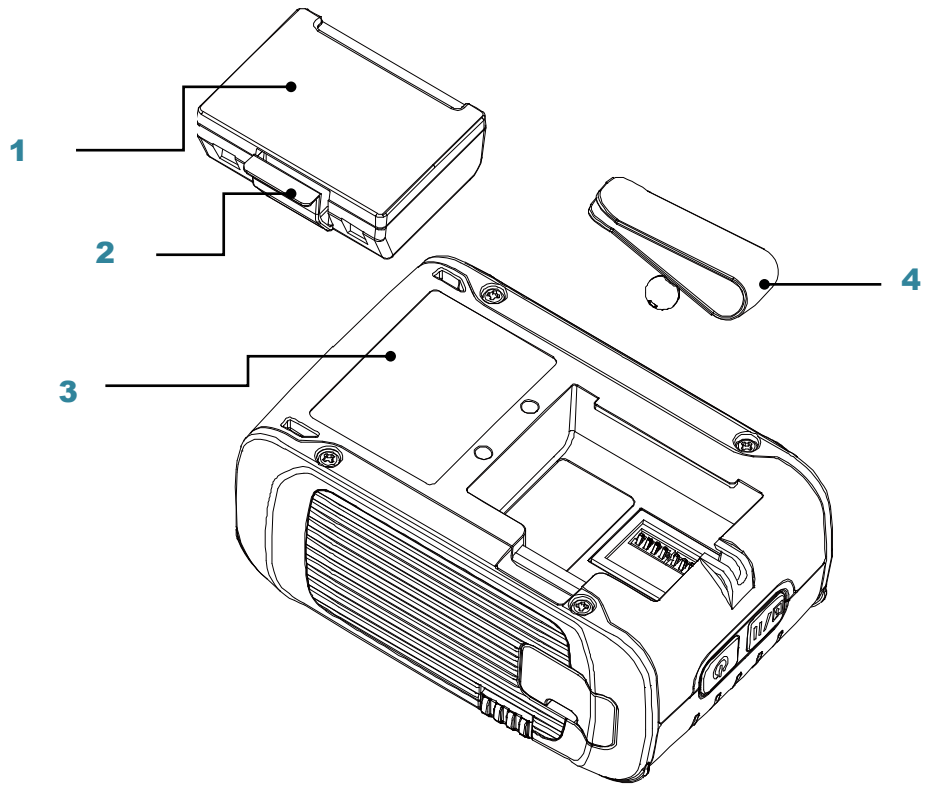
## 1.1 Overview

### Front View



- 1. Media cover
- 2. Platen roller
- 3. LED indicator
- 4. Feed/Pause button
- 5. Power on/off button
- 6. Interface cover
- 7. Media cover release button
- 8. Tear bar
- 9. Black mark sensor
- 10. Print head
- 11. USB interface
- 12. Power jack

## Rear View

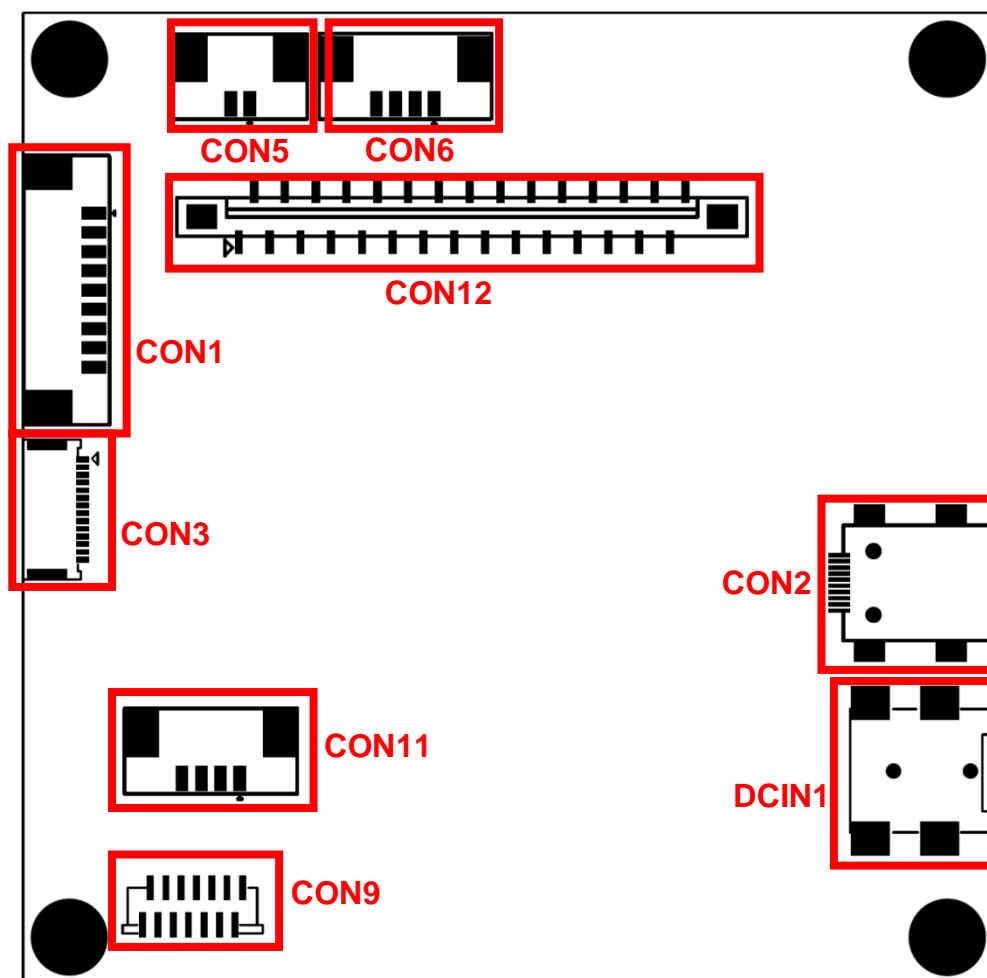


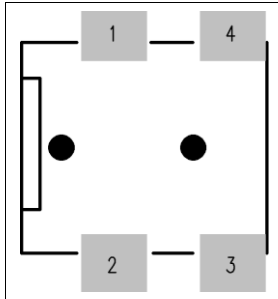
- 1.** Li-ion battery
- 2.** Battery open clasp
- 3.** Printer serial number label
- 4.** Belt chip

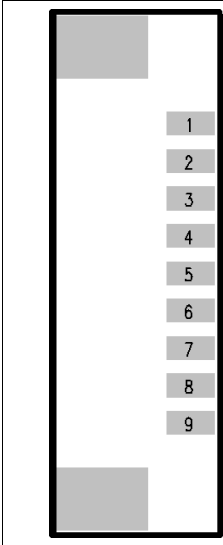
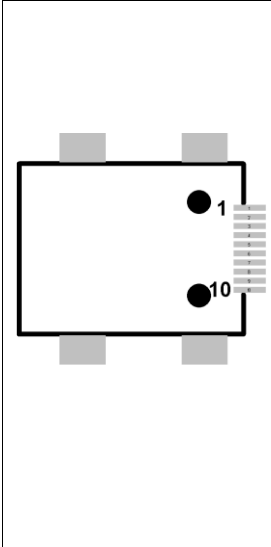
## 2. ELECTRONICS

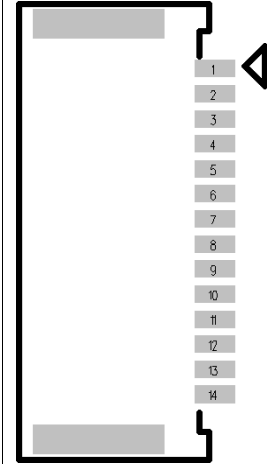
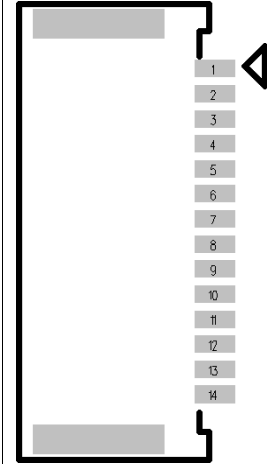
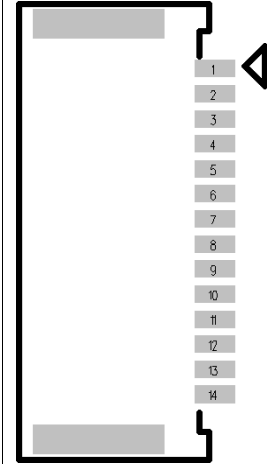
### 2.1 Summary of Board Connectors

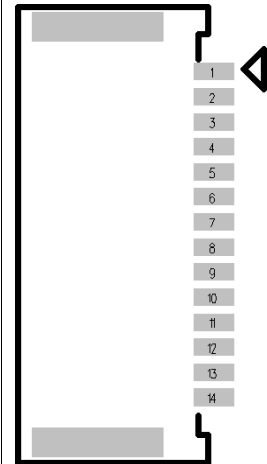
Main board top

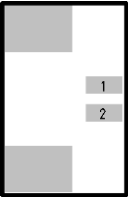
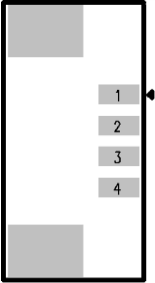
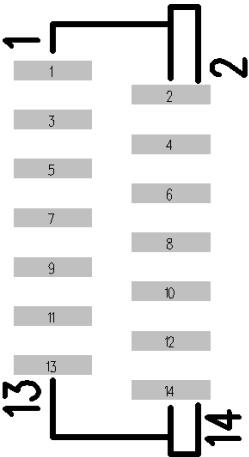


Connector	Description	
DCIN1	DC Jack	
		
	Pin	Description
	1	12V
	2	GND
	3	GND
4	12V	

Connector	Description																						
CON1	<p>Firmware download</p>  <table> <tr> <th>Pin</th><th>Description</th></tr> <tr> <td>1</td><td>3.3V</td></tr> <tr> <td>2</td><td>Data0</td></tr> <tr> <td>3</td><td>Data1</td></tr> <tr> <td>4</td><td>Data2</td></tr> <tr> <td>5</td><td>Data3</td></tr> <tr> <td>6</td><td>Clock</td></tr> <tr> <td>7</td><td>Command</td></tr> <tr> <td>8</td><td>NC</td></tr> <tr> <td>9</td><td>GND</td></tr> </table>	Pin	Description	1	3.3V	2	Data0	3	Data1	4	Data2	5	Data3	6	Clock	7	Command	8	NC	9	GND		
Pin	Description																						
1	3.3V																						
2	Data0																						
3	Data1																						
4	Data2																						
5	Data3																						
6	Clock																						
7	Command																						
8	NC																						
9	GND																						
CON2	<p>USB&amp;RS-232</p>  <table> <tr> <th>Pin</th><th>Description</th></tr> <tr> <td>1</td><td>NC</td></tr> <tr> <td>2</td><td>VBUS</td></tr> <tr> <td>3</td><td>TX</td></tr> <tr> <td>4</td><td>D-</td></tr> <tr> <td>5</td><td>RX</td></tr> <tr> <td>6</td><td>D+</td></tr> <tr> <td>7</td><td>RTS</td></tr> <tr> <td>8</td><td>NC</td></tr> <tr> <td>9</td><td>CTS</td></tr> <tr> <td>10</td><td>GND</td></tr> </table>	Pin	Description	1	NC	2	VBUS	3	TX	4	D-	5	RX	6	D+	7	RTS	8	NC	9	CTS	10	GND
Pin	Description																						
1	NC																						
2	VBUS																						
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8	NC																						
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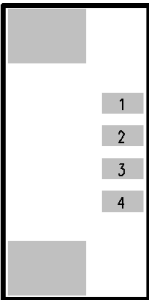
Connector	Description																															
CON3	Wi-Fi module: <table><tr><td rowspan="14"></td><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>3.3V</td></tr><tr><td>2</td><td>3.3V</td></tr><tr><td>3</td><td>3.3V</td></tr><tr><td>4</td><td>Reset</td></tr><tr><td>5</td><td>SPI (MISO)</td></tr><tr><td>6</td><td>SPI (RTS)</td></tr><tr><td>7</td><td>SPI (MOSI)</td></tr><tr><td>8</td><td>SPI (CTS)</td></tr><tr><td>9</td><td>Interrupt</td></tr><tr><td>10</td><td>SPI (Clock)</td></tr><tr><td>11</td><td>Mode: High : BT/Low : Wi-Fi</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></table>		Pin	Description	1	3.3V	2	3.3V	3	3.3V	4	Reset	5	SPI (MISO)	6	SPI (RTS)	7	SPI (MOSI)	8	SPI (CTS)	9	Interrupt	10	SPI (Clock)	11	Mode: High : BT/Low : Wi-Fi	12	GND	13	GND	14	GND
			Pin	Description																												
1			3.3V																													
2			3.3V																													
3			3.3V																													
4			Reset																													
5			SPI (MISO)																													
6			SPI (RTS)																													
7			SPI (MOSI)																													
8			SPI (CTS)																													
9			Interrupt																													
10			SPI (Clock)																													
11			Mode: High : BT/Low : Wi-Fi																													
12			GND																													
13		GND																														
14	GND																															

| Bluetooth module:   |  | Pin | Description                         | |---|-----|-------------------------------------| |   | 1   | 3.3V                                | |   | 2   | 3.3V                                | |   | 3   | 3.3V                                | |   | 4   | Reset                               | |   | 5   | UART (RX)                           | |   | 6   | UART (RTS)                          | |   | 7   | UART (TX)                           | |   | 8   | UART (CTS)                          | |   | 9   | Configurable Functional<br>GPIO     | |   | 10  | Bluetooth link status<br>indication | |   | 11  | Boot mode selection                 | |   | 12  | GND                                 | |   | 13  | GND                                 | | 14  | GND |                                     | |

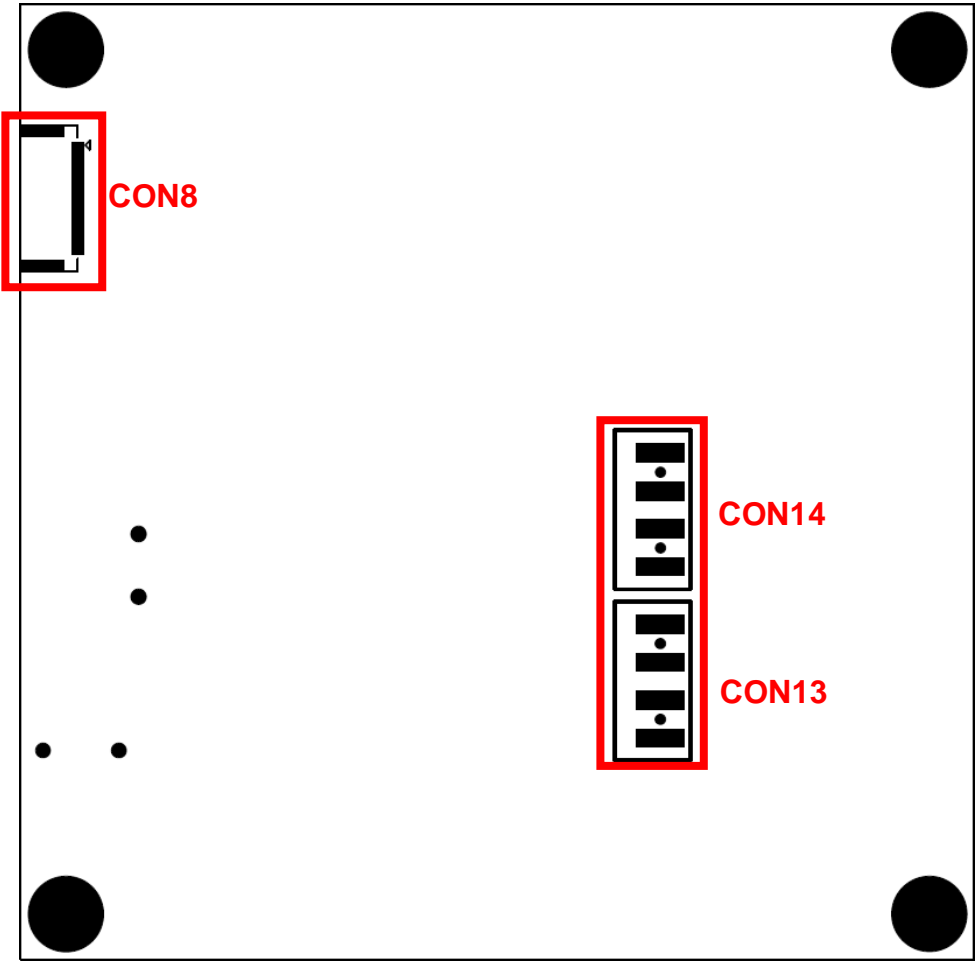
Connector	Description		
CON5	Head open sensor		
		Pin	Description
		1	Head open sensor receiver
		2	GND
CON6	Black mark sensor		
		Pin	Description
		1	3.3V
		2	Black mark sensor emitter
		3	Black mark sensor receiver
		4	3.3V
CON9	LED Board		
		Pin	Description
		1	VDDBU_3.3V
		2	LED Wi-Fi (Green)
		3	LED Bluetooth (Blue)
		4	LED Wi-Fi/Bluetooth (White)
		5	LED Charge status (Red)
		6	LED Battery capacity (Green)
		7	LED Battery capacity (Green)
		8	LED Battery capacity (Green)
		9	LED Error (Red)
		10	LED System status (Green)
		11	3.3V
		12	Feed key
		13	Power key
		14	GND

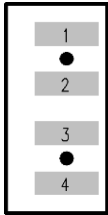
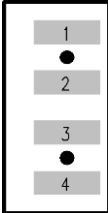
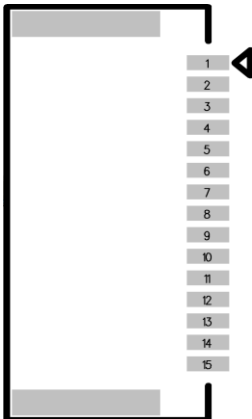




Connector	Description										
CON11	Stepping motor										
	<div><div></div><table><tr><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>A</td></tr><tr><td>2</td><td>/A</td></tr><tr><td>3</td><td>/B</td></tr><tr><td>4</td><td>B</td></tr></table></div>	Pin	Description	1	A	2	/A	3	/B	4	B
	Pin	Description									
	1	A									
	2	/A									
	3	/B									
4	B										

Main board bottom



Connector	Description																																	
CON13 CON14	Battery																																	
	CON13:																																	
		<table><tr><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>NTC</td></tr><tr><td>2</td><td>NTC</td></tr><tr><td>3</td><td>Battery positive</td></tr><tr><td>4</td><td>Battery positive</td></tr></table>	Pin	Description	1	NTC	2	NTC	3	Battery positive	4	Battery positive																						
	Pin	Description																																
	1	NTC																																
	2	NTC																																
3	Battery positive																																	
4	Battery positive																																	
CON14:																																		
	<table><tr><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>Battery negative</td></tr><tr><td>2</td><td>Battery negative</td></tr><tr><td>3</td><td>NC</td></tr><tr><td>4</td><td>NC</td></tr></table>	Pin	Description	1	Battery negative	2	Battery negative	3	NC	4	NC																							
Pin	Description																																	
1	Battery negative																																	
2	Battery negative																																	
3	NC																																	
4	NC																																	
CON8	NFC Module																																	
		<table><tr><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>3.3V</td></tr><tr><td>2</td><td>GND</td></tr><tr><td>3</td><td>NC</td></tr><tr><td>4</td><td>NC</td></tr><tr><td>5</td><td>Interrupt</td></tr><tr><td>6</td><td>GND</td></tr><tr><td>7</td><td>I2C (Data)</td></tr><tr><td>8</td><td>I2C (Clock)</td></tr><tr><td>9</td><td>GND</td></tr><tr><td>10</td><td>Reset</td></tr><tr><td>11</td><td>Firmware download control</td></tr><tr><td>12</td><td>NC</td></tr><tr><td>13</td><td>3.3V</td></tr><tr><td>14</td><td>3.3V</td></tr><tr><td>15</td><td>GND</td></tr></table>	Pin	Description	1	3.3V	2	GND	3	NC	4	NC	5	Interrupt	6	GND	7	I2C (Data)	8	I2C (Clock)	9	GND	10	Reset	11	Firmware download control	12	NC	13	3.3V	14	3.3V	15	GND
	Pin	Description																																
	1	3.3V																																
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	7	I2C (Data)																																
	8	I2C (Clock)																																
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	11	Firmware download control																																
	12	NC																																
	13	3.3V																																
	14	3.3V																																
	15	GND																																

### 3. MECHANISM

#### 3.1 Replacing the Platen Roller Assembly

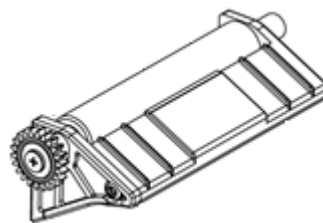
1. Open the printer cover by pressing the media release button.



2. Use a Phillips screwdriver to remove two screws on platen roller assembly.



3. Replace the platen roller assembly.



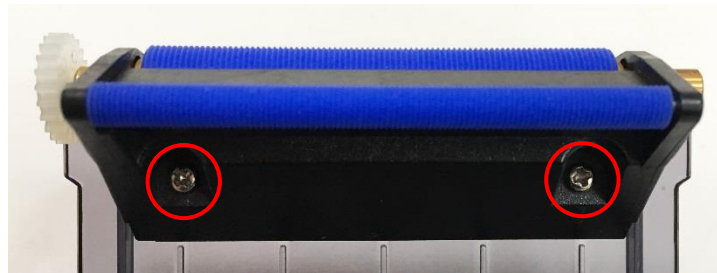
4. Reassemble the parts in the reverse procedures.

## 3.2 Replacing the Linerless Platen Roller Assembly

1. Open the printer cover by pressing the media release button.



2. Use a Phillips screwdriver to remove two screws on platen roller assembly.



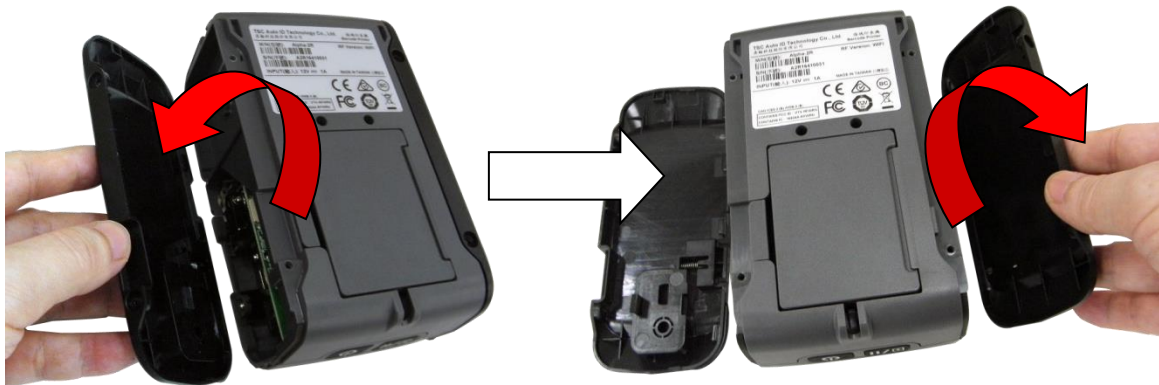
3. Replace the linerless platen roller assembly.
4. Reassemble the parts in the reverse procedures.

### 3.3 Replacing the 1" / 2" paper core adapter

1. Use hex wrench (#9) to remove four screws on lower cover.



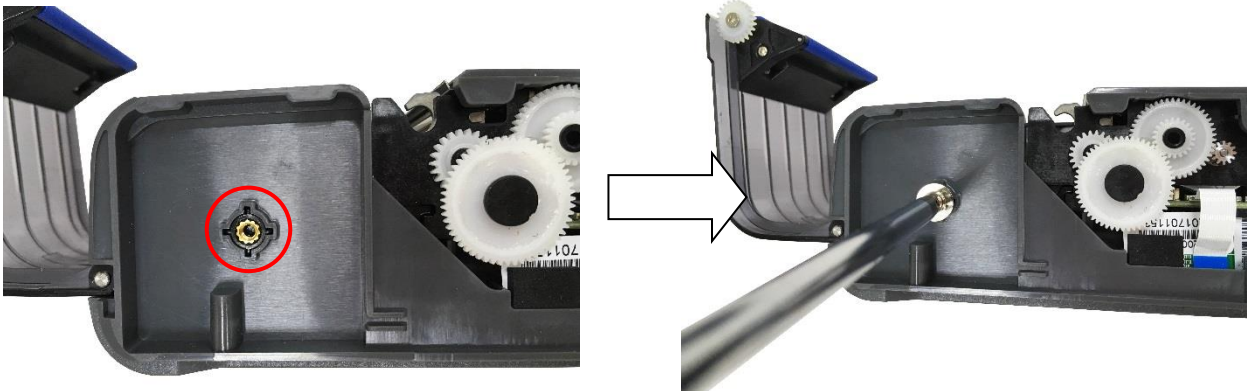
2. Remove the right and left side covers by rotating the covers as shown below.



3. Replace the adapters on both sides of paper core. (Please note the direction shown as below)



4. Fix the screws on the adapters with both sides as indicated.



5. Complete the installation of 1" / 2" paper core adapter.



1" / 2" paper core with spindle installed

6. Reassemble the parts in the reverse procedures.

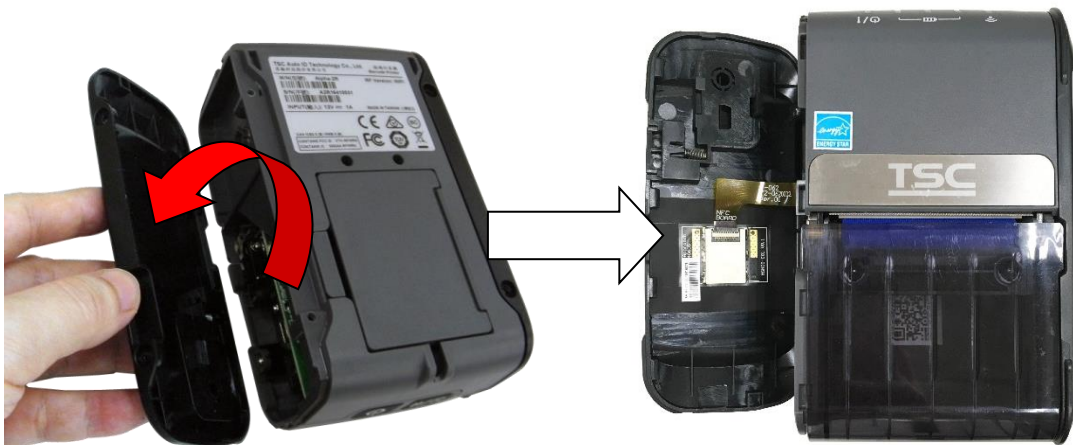


### 3.4 Replacing the NFC module

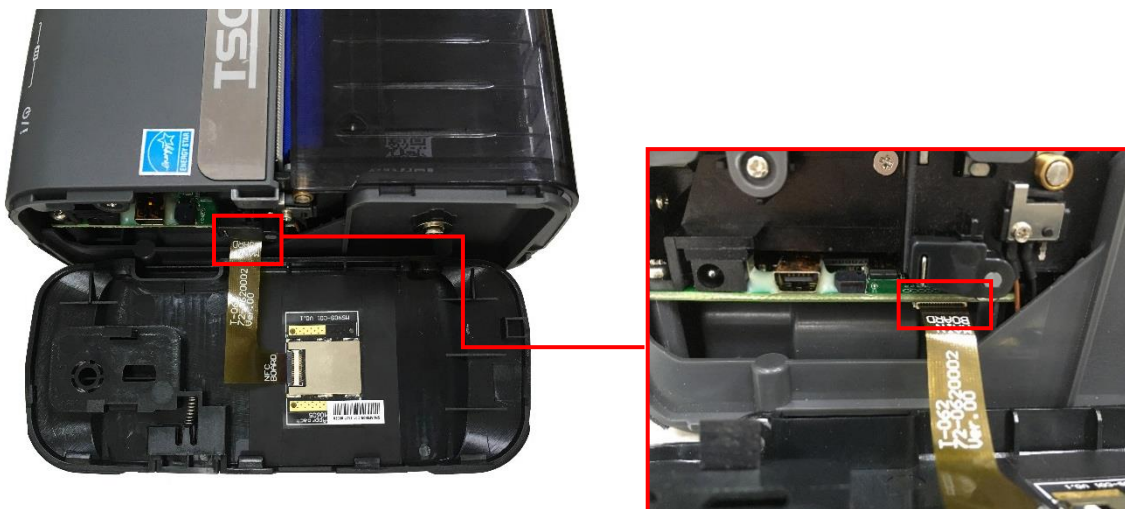
1. Use hex wrench (#9) to remove two screws on lower cover.



2. Remove the left side cover by rotating the cover as shown below.



3. Unplug the flat cable on the slot as indicated.



NFC module cable slot



4. Replace the NFC module. (Please place the NFC module on the edge of rib as indicated.)



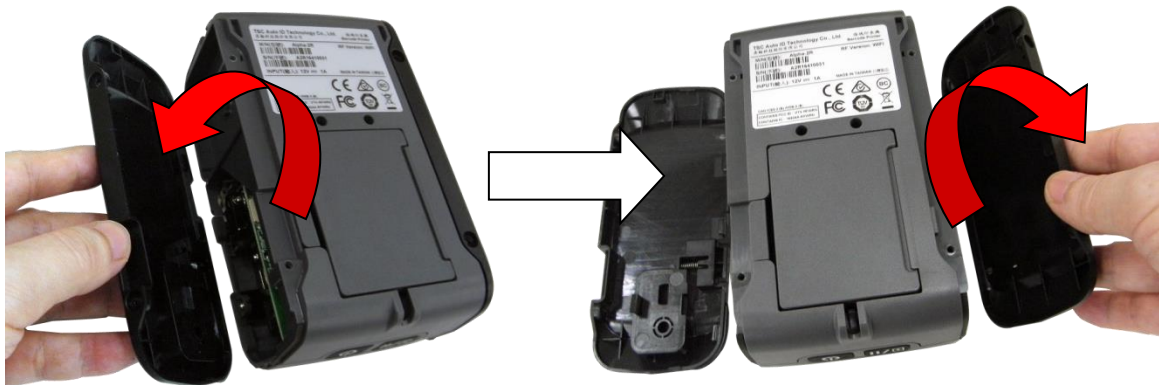
5. Reassemble the parts in the reverse procedures.

### 3.5 Replacing the LED & Keys Panel Board

1. Use hex wrench (#9) to remove four screws on lower cover.



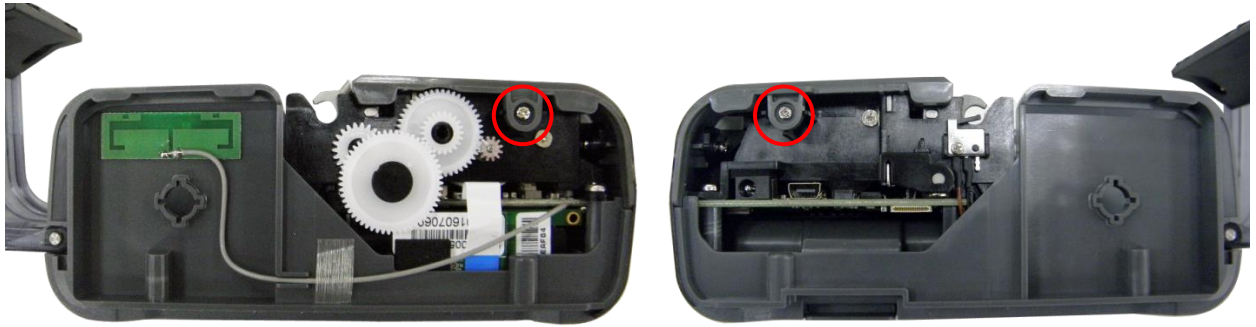
2. Remove the right and left side covers by rotating the covers as shown below.



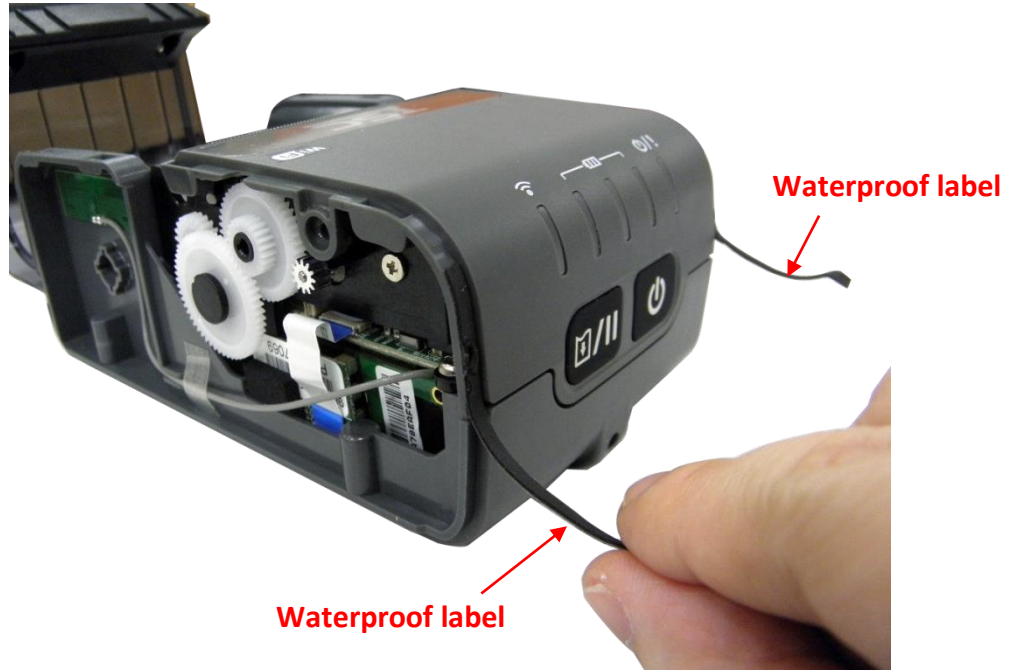
3. Open the printer cover by pressing the media release bar as shown.



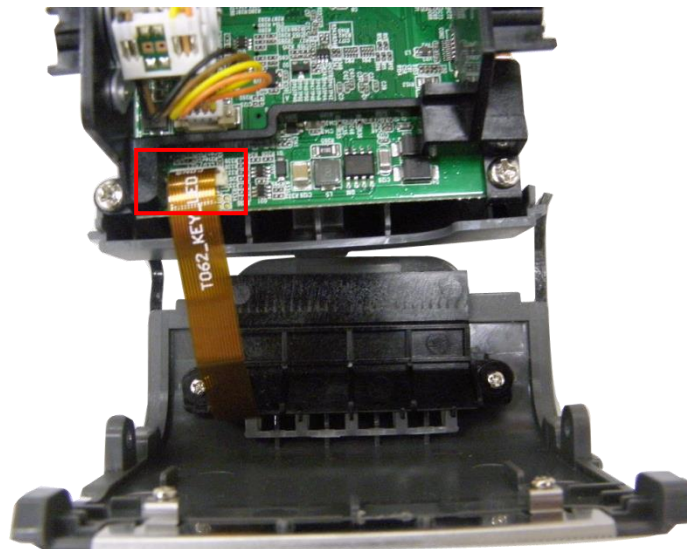
4. Remove the two screws on both side of the printer.



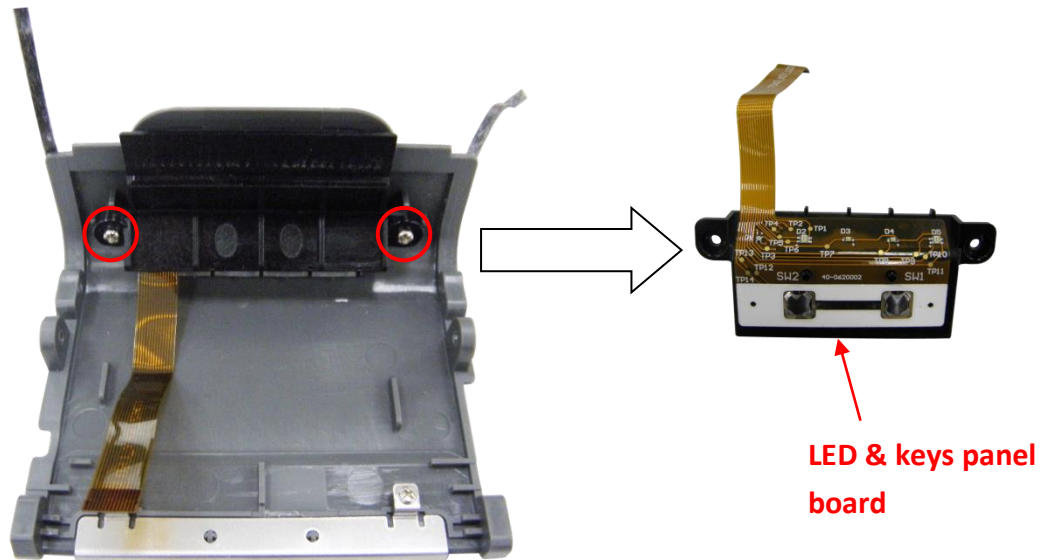
5. Peel off the waterproof labels on two sides of printer.



6. Disconnect the flat cable on the main board. Remove the top cover assembly.



7. Remove two screws on top cover assembly to replace the LED & keys panel board.

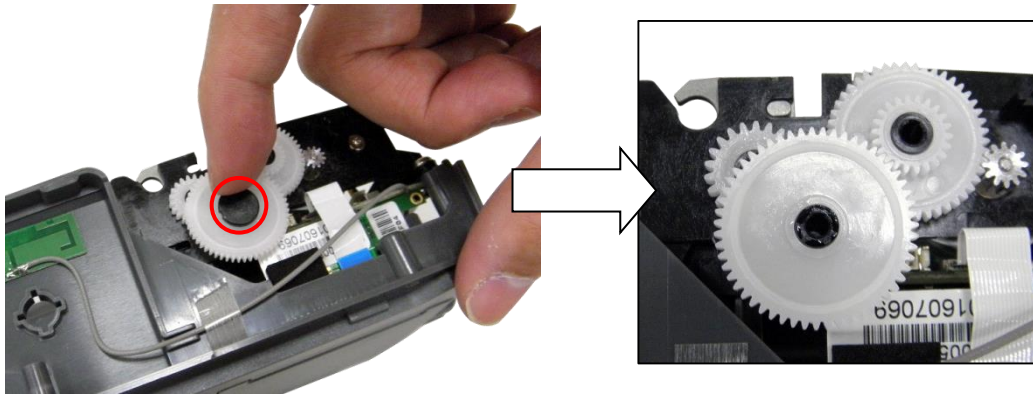


8. Reassemble the parts in the reverse procedures.

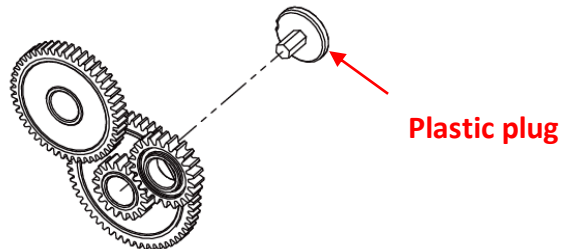


### 3.6 Replacing the Gear Assembly & Stepping Motor

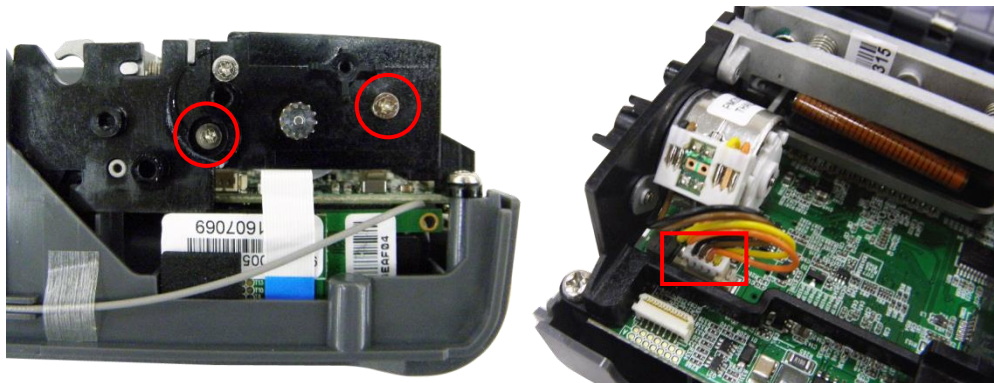
1. Refer to section 3.2 to remove the right, left side and top covers.
2. Remove the plastic plug (black) securing the gears at the top.



3. Remove/Replace the gears assembly.



4. Remove two screws securing on the printer side as shown below. Disconnect the stepping motor connector on main board.



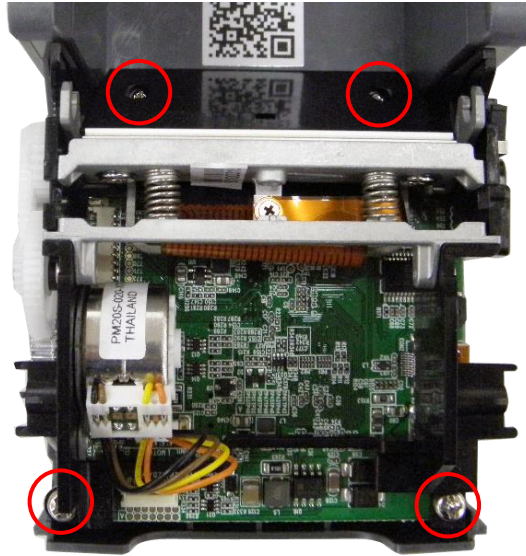
5. Remove/Replace the stepping motor assembly.



6. Reassemble the parts in the reverse procedures.

### 3.7 Replacing the Wi-Fi/Bluetooth Module

1. Refer to section 3.2 to remove the right, left side and top covers.
2. Remove four screws securing the internal mechanism.



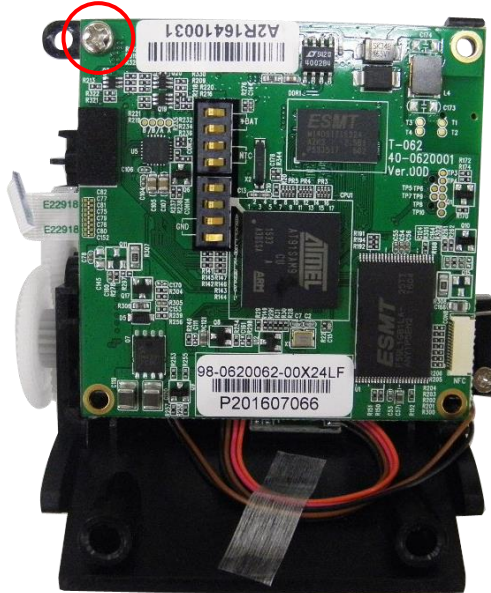
3. Disconnect the flat cable on the Wi-Fi/Bluetooth control board. (For Wi-Fi module, disconnect the antenna connector on the Wi-Fi module.) Remove/Replace the Wi-Fi/Bluetooth module.

Wi-Fi module	Bluetooth module
Two photographs of a Wi-Fi module. The top photograph shows the module with a white flat cable connected to its edge; a red rectangular box highlights the connection point. The bottom photograph shows the module with a red circle highlighting a small gold-colored antenna connector on its surface. A label on the module includes the text "TSC AUTO ID Technology Co., Ltd.", "Model: RF-WRN", "IC ID: T0524A-RF-WRN", "FCC ID: VTY-RF-WRN", "OMIT ID: 2015A14954", and "CCAF 15LP162079".	A photograph of a Bluetooth module. A red rectangular box highlights a connection point on the module's surface. A label on the module includes the text "T-062", "40-0620004", "Ver.00C", and "PO LABEL".

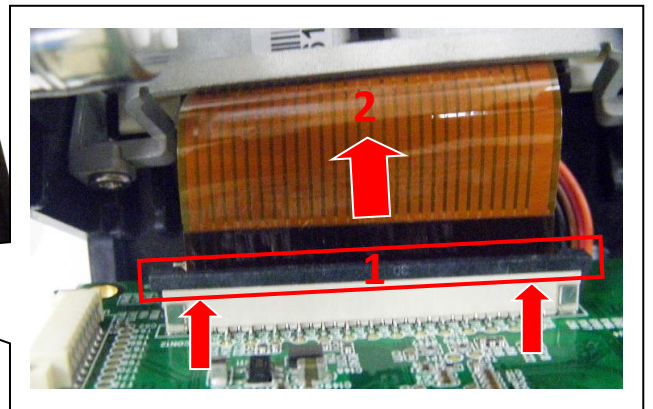
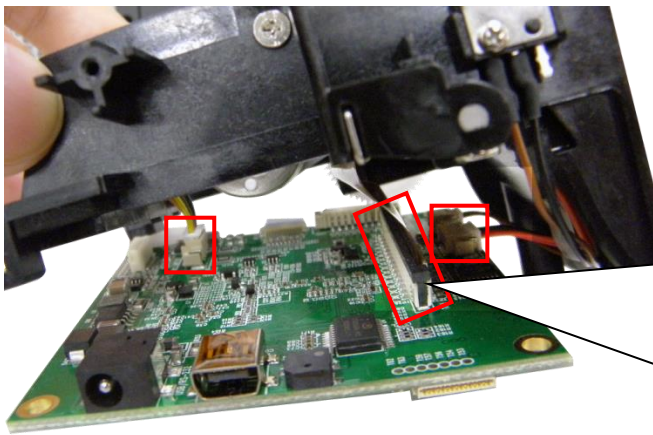
4. Reassemble the parts in the reverse procedures.

### 3.8 Replacing the Main Board Assembly

1. Refer to section 3.4 to remove the Wi-Fi or Bluetooth module.
2. Remove a screw on the main board.



3. Disconnect all the connectors on the main board. (For TPH connector, loosen the connector lock (black) then disconnect the flat cable from the main board.)



4. Replace the main board.





**Note:**

If installing Wi-Fi module, please check the Wi-Fi signal band on configuration page for your using region after replacing the main board. If any questions, please contact the Customer Service Department of your purchased reseller or distributor for assistance.

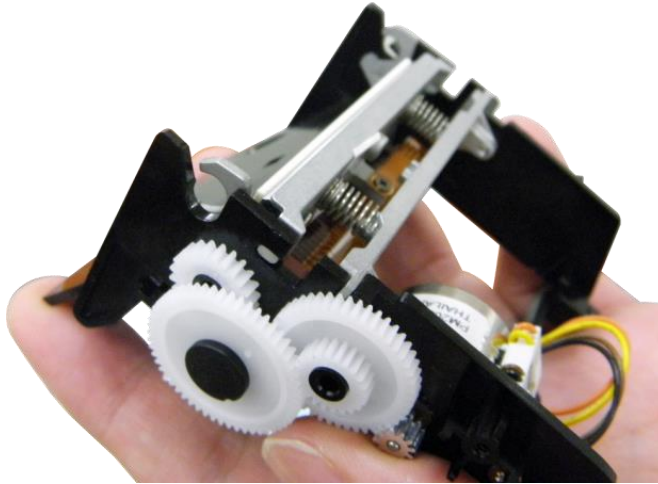
US	EUR
***** WIFI VERSION: 1.3.1e WIFI MAC ADDRESS: 00-23-A7-65-19-30 WIFI Region: US WIFI MODE: INFRASTRUCTURE WIFI SSID: RD_AP24 WIFI DHCP ENABLED: YES WIFI IP ADDRESS: 0.0.0.0 WIFI SUBNET MASK: 0.0.0.0 WIFI DEFAULT GATEWAY: 0.0.0.0 WIFI PRINTER NAME: PS-651930 WIFI RAW PORT: 9100 *****	***** WIFI VERSION: 1.3.1e WIFI MAC ADDRESS: 00-23-A7-65-19-30 WIFI Region: EUR WIFI MODE: INFRASTRUCTURE WIFI SSID: RD_AP24 WIFI DHCP ENABLED: YES WIFI IP ADDRESS: 0.0.0.0 WIFI SUBNET MASK: 0.0.0.0 WIFI DEFAULT GATEWAY: 0.0.0.0 WIFI PRINTER NAME: PS-651930 WIFI RAW PORT: 9100 *****

5. Reassemble the parts in the reverse procedures.

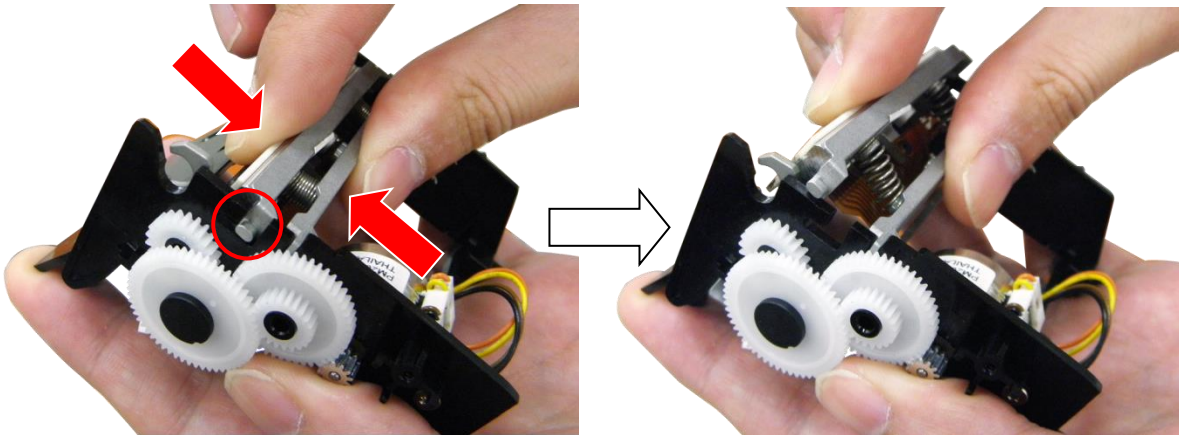


### 3.9 Replacing the Print Head Assemble

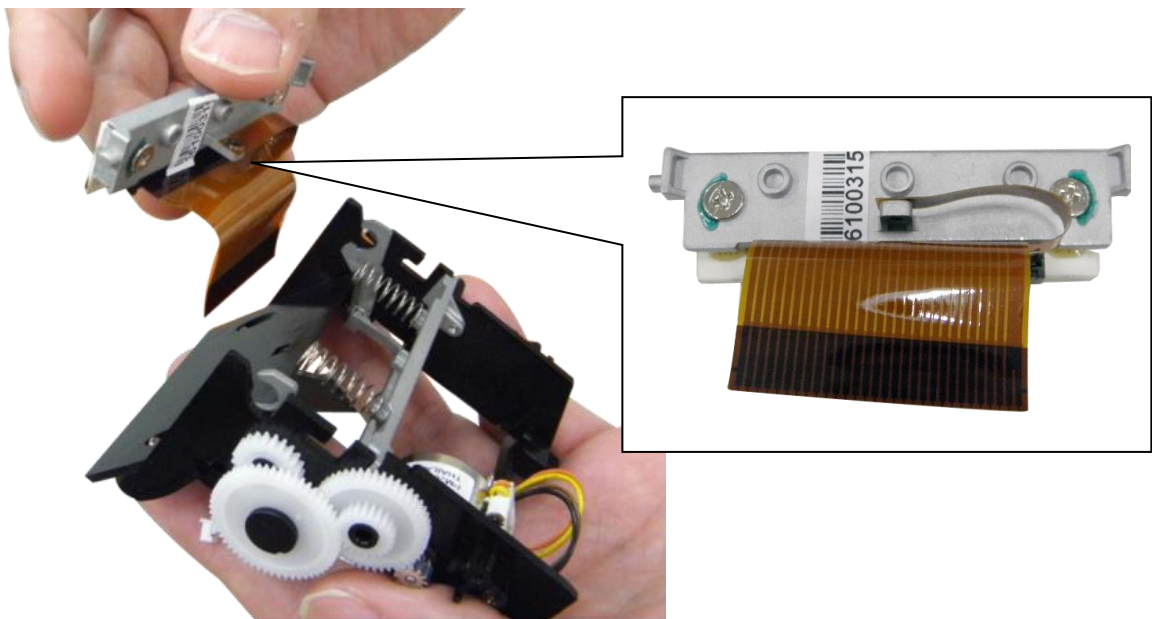
1. Refer to section 3.5 to remove the main board, take out the internal mechanism as shown below.



2. Loosen both side tabs of print head module by pressing the bracket as shown below.

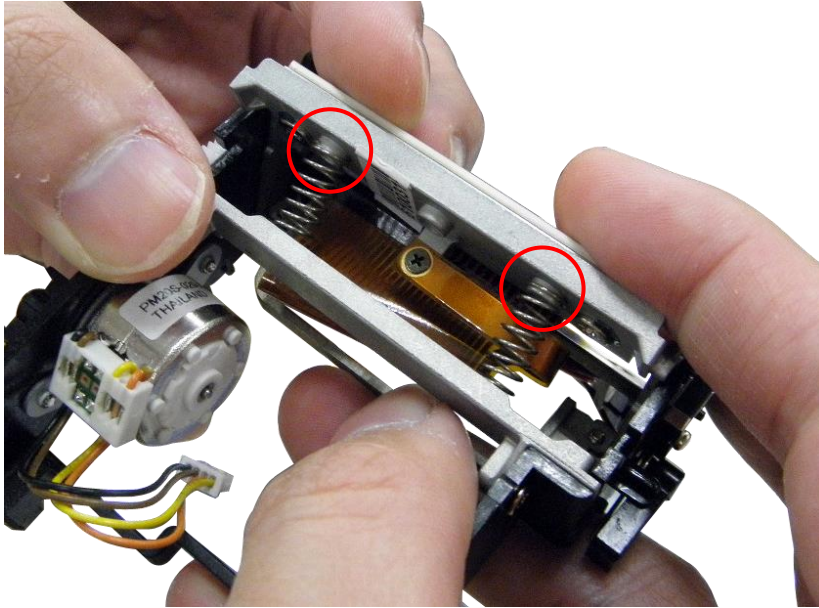


3. Replace the print head module.



**Note:**

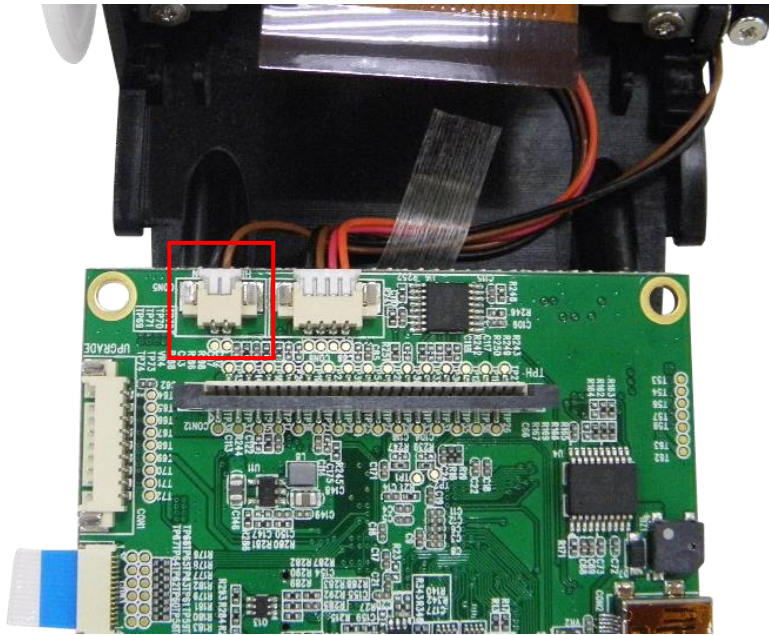
**Please insert the springs into the boss first to install print head module.**



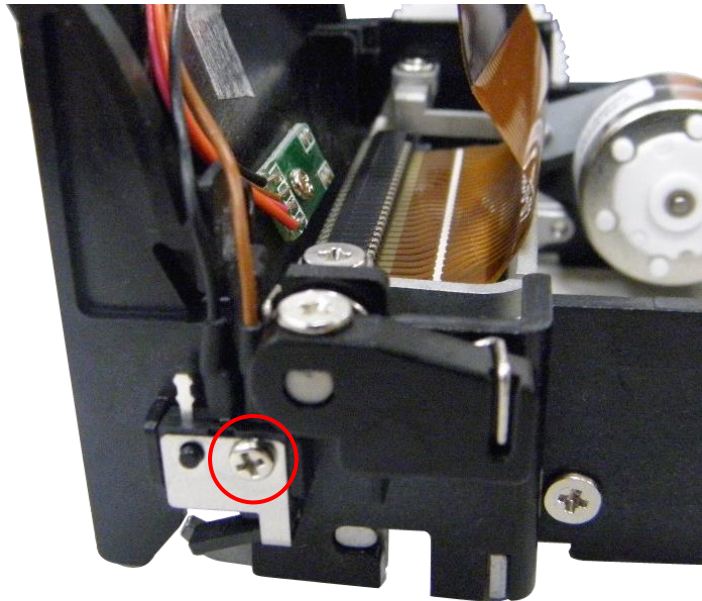
4. Reassemble the parts in the reverse procedures.

### 3.10 Replacing the Hand Open Sensor Assemble

1. Refer to section 3.5 to remove the main board. Disconnect the hand open sensor connector on main board.



2. Remove a screw to replace the hand open sensor assembly.

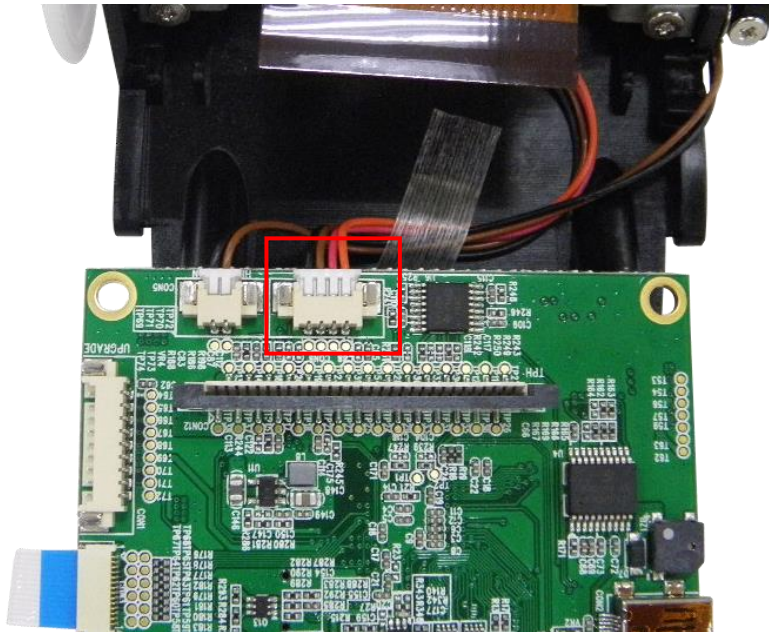


3. Reassemble the parts in the reverse procedures.

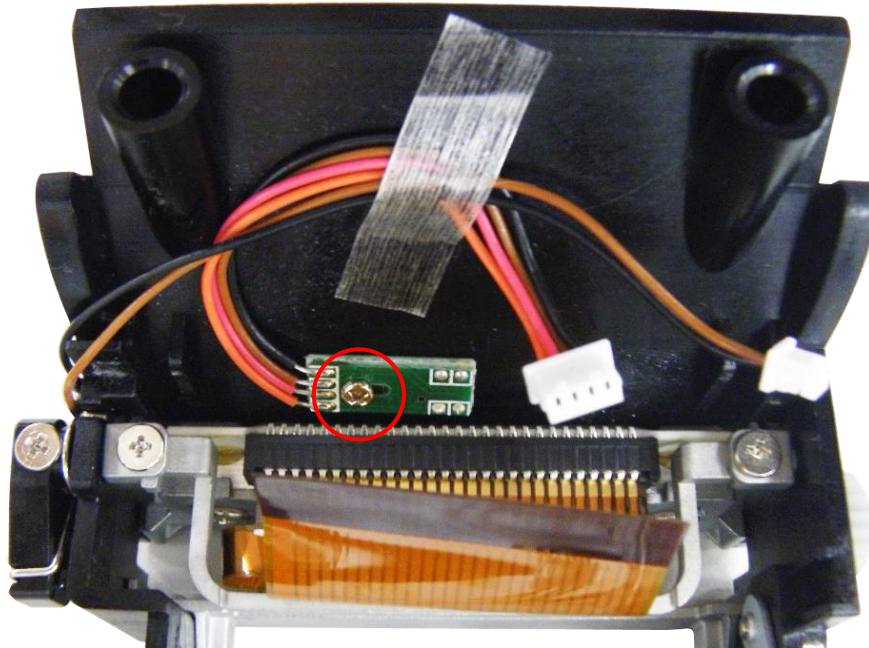


### 3.11 Replacing the Black Mark Sensor Assembly

1. Refer to section 3.5 to remove the main board. Disconnect the black mark sensor connector on main board.



2. Remove a screw to replace the black mark sensor assembly.



3. Reassemble the parts in the reverse procedures.

## 4. TROUBLESHOOTING

### 4.1 Common Problems

The following guide lists the most common problems that may 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
<b>Power indicator does not illuminate</b>	<ul style="list-style-type: none"> <li>* The battery is not properly installed.</li> <li>* The battery is dead.</li> </ul>	<ul style="list-style-type: none"> <li>* Reinstall the battery.</li> <li>* Switch the printer on.</li> <li>* Charge the battery.</li> </ul>
- The printer status from DiagTool shows <b>"Head Open"</b> .	<ul style="list-style-type: none"> <li>* The printer carriage is open.</li> </ul>	<ul style="list-style-type: none"> <li>* Please close the print carriage.</li> </ul>
- The printer status from DiagTool shows <b>"Out of Paper"</b> .	<ul style="list-style-type: none"> <li>* Running out of media roll.</li> <li>* The media is installed incorrectly.</li> <li>* Black mark sensor is not calibrated.</li> </ul>	<ul style="list-style-type: none"> <li>* Supply a new media roll.</li> <li>* Reinstall the media roll.</li> <li>* Calibrate the black mark sensor.</li> </ul>
- The printer status from DiagTool shows <b>"Paper Jam"</b> .	<ul style="list-style-type: none"> <li>* Black mark sensor is not set properly.</li> <li>* Make sure media size is set properly.</li> <li>* Media may be stuck inside the printer mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>* Calibrate the black mark sensor.</li> <li>* Set media size correctly.</li> </ul>
<b>Memory full ( FLASH / DRAM )</b>	<ul style="list-style-type: none"> <li>* The space of FLASH/DRAM is full.</li> </ul>	<ul style="list-style-type: none"> <li>* Delete unused files in the FLASH/DRAM.</li> <li>* Run printer self-test and check the available memory space for DRAM or FLASH.</li> <li>* Check the available memory space for DRAM or FLASH via DiagTool.</li> </ul>
<b>Poor Print Quality</b>	<ul style="list-style-type: none"> <li>* Media is loaded incorrectly</li> <li>* Dust or adhesive accumulation on the print head.</li> <li>* Print density is not set properly.</li> <li>* Printhead element is damaged.</li> </ul>	<ul style="list-style-type: none"> <li>* Reload the supply.</li> <li>* Clean the print head.</li> <li>* Clean the platen roller.</li> <li>* Adjust the print density and print speed.</li> <li>* Run printer self-test and check the print head test pattern if there is dot missing in the pattern.</li> <li>* Change proper media roll.</li> </ul>
<b>Missing printing on the left or right side of label</b>	<ul style="list-style-type: none"> <li>* Wrong label size setup.</li> </ul>	<ul style="list-style-type: none"> <li>* Set the correct label size.</li> </ul>
<b>Gray line on the blank label</b>	<ul style="list-style-type: none"> <li>* The print head is dirty.</li> <li>* The platen roller is dirty.</li> </ul>	<ul style="list-style-type: none"> <li>* Clean the print head.</li> <li>* Clean the platen roller.</li> </ul>

<b>Irregular printing</b>	<ul style="list-style-type: none"> <li>* The printer is in Hex Dump mode.</li> <li>* The RS-232 setting is incorrect.</li> </ul>	<ul style="list-style-type: none"> <li>* Turn off and on the printer to skip the dump mode.</li> <li>* Re-set the Rs-232 setting.</li> </ul>
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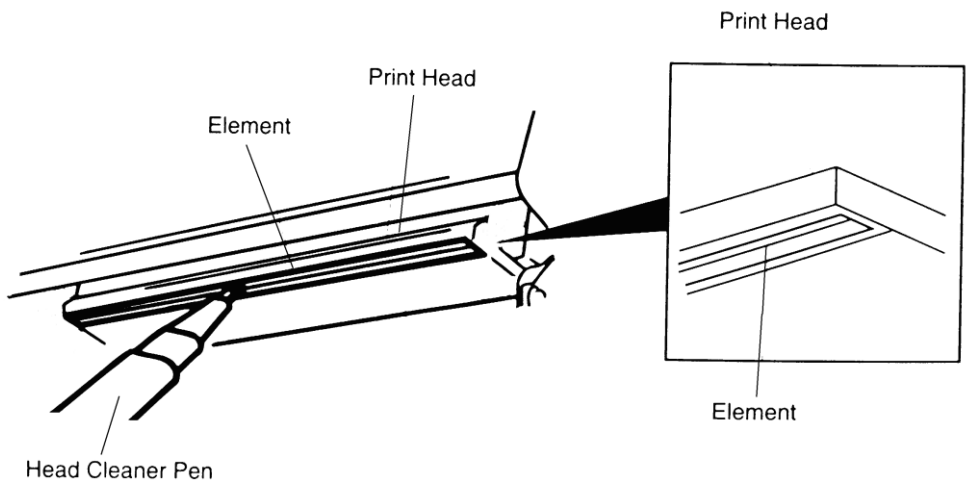
## 5. MAINTENANCE

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

1. Please use one of following material to clean the printer.

- Cotton swab
- Lint-free cloth
- Vacuum / Blower brush
- 100% ethanol

2. The cleaning process is described as following,

Printer Part	Method	Interval
<b>Print Head</b>	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 and 100% ethanol to clean the print head surface.	Clean the print head when changing a new label roll
	 <p>The diagram illustrates the print head assembly. It shows a 'Print Head' with an 'Element' inside. A 'Head Cleaner Pen' is shown cleaning the 'Element'. An inset provides a closer view of the 'Element' within the 'Print Head'.</p>	
<b>Platen Roller</b>	1. Turn the power off. 2. Rotate the platen roller and wipe it thoroughly with 100% ethanol and a cotton swab, or lint-free cloth.	Clean the platen roller when changing a new label roll
<b>Tear Bar/Peel Bar</b>	Use the lint-free cloth with 100% ethanol to wipe it.	As needed
<b>Sensor</b>	Compressed air or vacuum	Monthly
<b>Exterior</b>	Wipe it with water-dampened cloth	As needed
<b>Interior</b>	Brush or vacuum	As needed

### Note:

- Do not touch printer head by 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 printer life.

## Revise History

Date	Content	Editor
2018/1/19	Add Ch.3.2 Replacing the Linerless Platen Roller Assembly Add Ch.3.3 Replacing the 1" / 2" paper core adapter Add Ch.3.4 Replacing the NFC module	Kate







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