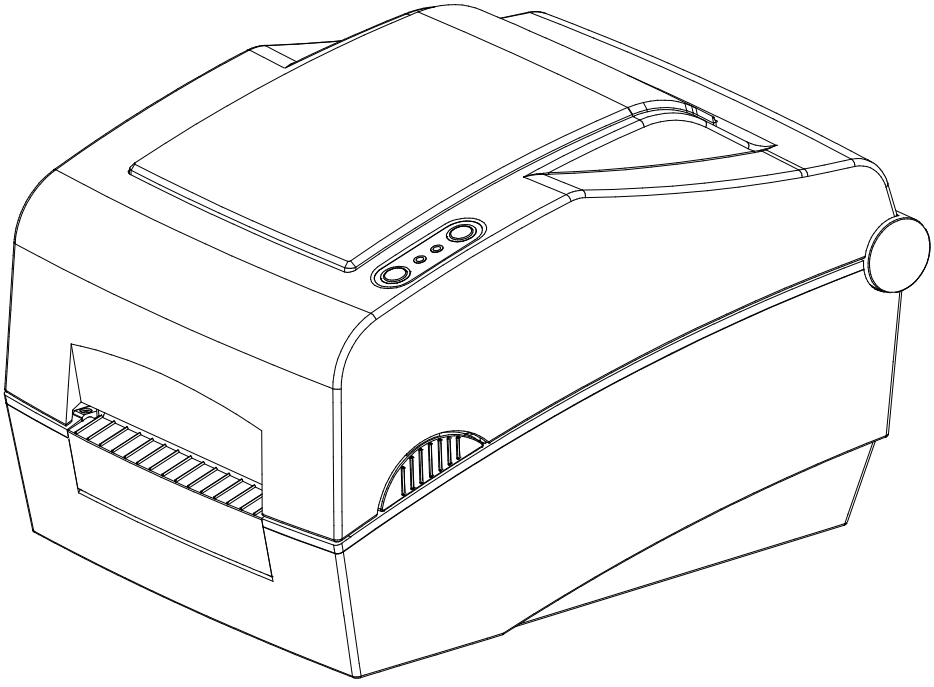
BIXOLON®

Service Manual

Label Printer

Rev. 1.04

SLP-TX400 / TX400E
SLP-TX403 / TX403E



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■ About

About this Manual

This Service Manual describes how to perform hardware service maintenance for the BIXOLON SLP-TX400, SLP-TX400E, SLP-TX403, SLP-TX403E Label Printer.

Notes

Notes may appear anywhere in the manual. They draw your attention to additional information about the item.

Precaution symbols


Indicates a Safety Precaution that applies to this part component.


Indicates the part or component is an electro-statically sensitive device. Use caution when handling these parts.

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■ Overview of this Label Printer

This System Label Printer is a ATMEL processor-based system, using a 400 MHz ARM926EJ-S Processor. This Service Manual provides the technical information for many individual component systems, circuits and gives an analysis of the operations performed by the circuits. If you need more technical information, please contact our service branch or R&D center.
All information in this manual is subject to change without prior notice. Therefore, you must check the correspondence of your manual with your machine. No part of this manual may be copied or reproduced in any form or by any means, without the prior written consent of BIXOLON Co., Ltd.

We at BIXOLON maintain ongoing efforts to enhance and upgrade the functions and quality of all our products. In following, product specifications and/or user manual content may be changed without prior notice.

1. Precaution Statements

1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.

2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices including: nonmetallic control knobs and compartment covers.

3. Make sure that there are no cabinet openings through which people – particularly children – might insert fingers and contact dangerous voltages. Such openings include excessively wide cabinet ventilation slots and improperly fitted covers and drawers.

4. Leakage Current Hot Check:
   WARING: Do not use an isolation transformer during this test.
   Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Applications), and Underwriters Laboratories (UL Publications UL1410, 59.7).
   With the unit completely reassembled, plug the AC line cord directly into a 100VAC or 240VAC outlet of the Adaptor.
   With the unit's AC switch first in the ON position and then OFF, measure the current between a known Earth ground(metal water pipe, conduit, etc.) and all exposed metal part, including: metal cabinet, frame, and screw-heads and printer. The current measure should not exceed 0.1 milliamp. Reverse the power-plug prong in the AC outlet and repeat the test.

5. Design Alteration Warning:
   Never alter or add to the mechanical or electrical design of the ECR. Unauthorized alterations might create a safety hazard. Also any design changes or additions will void the manufacture's warranty.

6. Components, parts and wiring that appear to have overhead or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damaged or overheating and correct any potential hazards.

7. Observe the original lead dress, especially near the following areas: sharp edges, and especially the AC and high voltage supplies. Always inspect for pinched, out-of-place, or frayed wiring.
   Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.

8. Product Safety Notice:
   Some electrical and mechanical parts have special safety-related characteristics, which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original-even if the replacement is rated for higher voltage, wattage, etc.
   Components that are critical for safety are indicated in the circuit diagram by shading, () or ().
   Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

CAUTION.
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacture.
Dispose of used batteries according to the manufacture's instruction.

1-2 Servicing Precaution

WARNING 1: First read the Safety Precaution section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precaution.

WARNING 2: An electrolytic capacitor installed with the wrong polarity might explode.

1. Always unplug the unit's AC power cord from the AC power source or the Power Switch off before attempting to:
   (a) Remove or reinstall any component or assembly,
   (b) Disconnect an electrical plug or connector,
   (c) Connect a test component in parallel with an electrolytic capacitor.

2. Some components are raised above the printed circuit board for safety.
   An insulation tube or tape is sometime used.
   The internal wiring is sometimes clamped to prevent contact with thermally hot components.
   Reinstall all such elements to their original position.

3. After servicing, always check that the screws, components and wiring have been correctly reinstalled.
   Make sure that the portion around the serviced part has not been damaged.

4. Check the insulation between the blades of the AC plug and accessible conductive parts
   (example: metal panels and input terminals).

5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 mega-ohm.

6. Never defeat any of the B+ voltage interlock. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

7. Always connect an instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Precaution for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor (solid state) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damaged caused by static electricity.

2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power-this is an Electric shock precaution.)

3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.

4. Do not use freon-propelled chemical. These can generate electrical charges that damage ESDs.

5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.

6. Use only an anti-static solder removal device. Many solder removal devices are not rated as anti-static; these can accumulate sufficient electrical charge to damage ESDs.

7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the device will be installed.

9. Minimize body motions when handling unpacked replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damaged an ESD.

1-4 Operational Precautions

1. The heating element of the printer mechanism's thermal head and the driver IC are easily damaged. Never allow these components to come into contact with metal or other hard objects.

2. Never touch the printer mechanism's heating element with your hand. Doing so can damage the heating element and affect proper operation.

3. The head and motor areas are very hot during and immediately after printing. Do not touch components in these areas directly with your hand.

4. Do not use any paper other than these specified in this manual otherwise print head warranty and print quality are affected adversely.

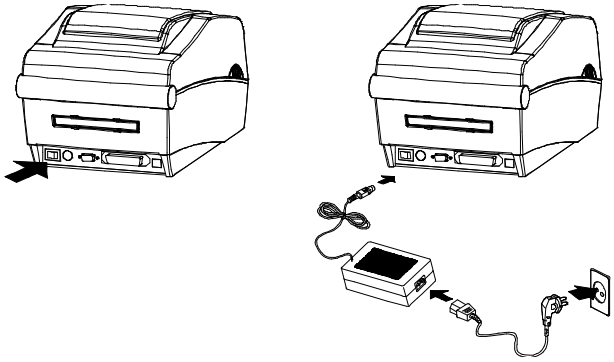
5. Thermal paper starts to color at around 70ºC. Take care to protect unused and printed thermal paper against the affects of heat, light and characters on the paper to feed.

6. Take the roll paper out of the printer when you will not use the printer for a long time in a high temperature and humidity environment.

2. Operating Instruction and Installation

2-1 Installation

2-1-1 SMPS Installation



1) Turn off the printer power switch.

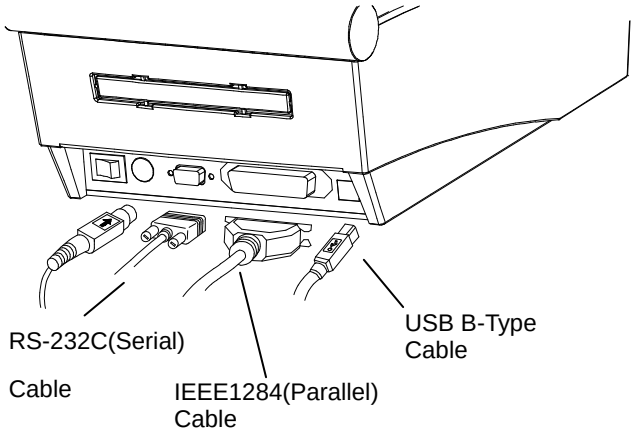
2) Check to see that the AC adapter voltage matches that of the power source.

3) Connect the AC adapter jack to the printer power connector.

4) Connect the power cord to the AC adapter.

5) Connect the power cord to a power source/outlet.

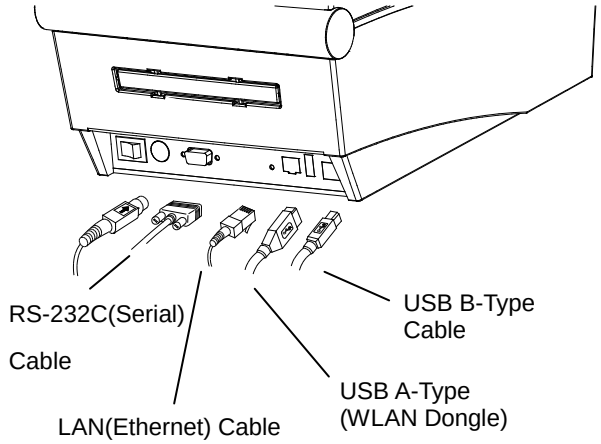
2-1-2 Interface Cable Installation(STD Model)



1) Turn off the power switch.

2) Connect the communication cable to the printer communication port to be used.
   - Connect the RS-232C(Serial) Cable to the SERIAL port and tighten the screw on both sides.
   - Connect the IEEE1284(Parallel) Cable to the PARALLEL port and fasten the clips on both sides.
   - Connect USB B-Type cable to the USB port.

2-1-3 Interface Cable Installation(Ethernet Model)

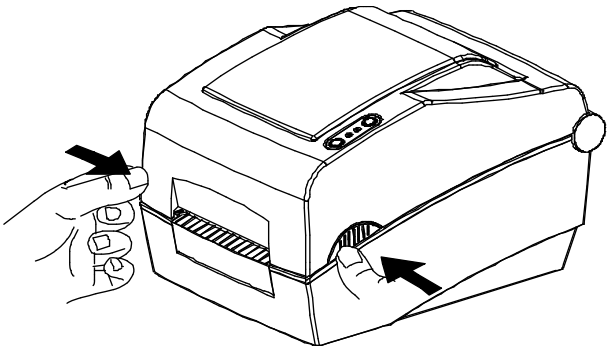


1) Turn off the power switch.

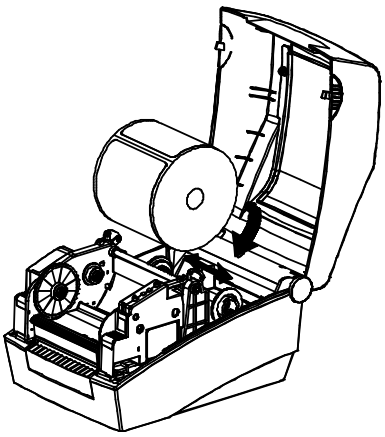
2) Connect the communication cable to the printer communication port to be used.
   - Connect the RS-232C(Serial) Cable to the SERIAL port and tighten the screw on both sides.
   - Connect the LAN(Ethernet) Cable to the ETHERNET port
   - Connect USB A-Type(WLAN Dongle) to the HOST port.
   - Connect USB B-Type cable to the USB port.

2-1-4 Paper Roll Installation

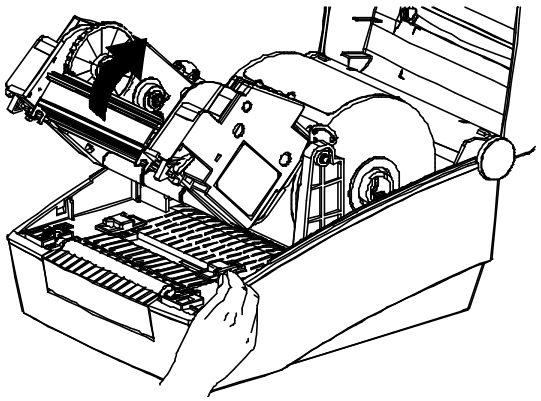
1) Open the Paper Cover.



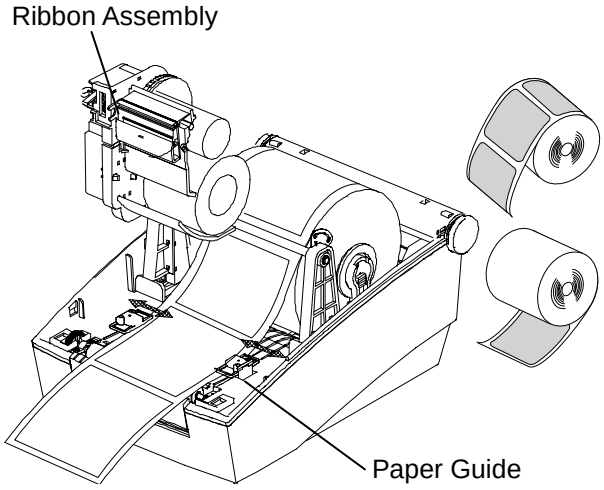
2) Spread the paper holder and insert paper as shown.



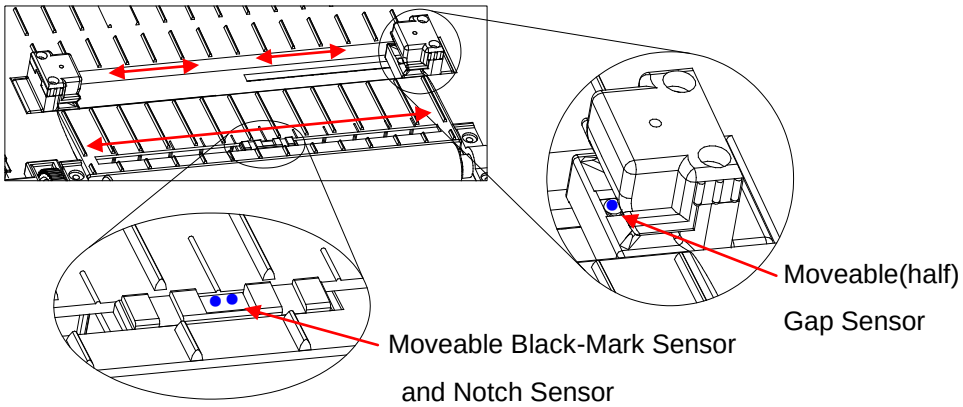
3) Open the Ribbon Assembly and spread the paper guide.



4) Feed the paper between the Paper Guide on both sides.



5) After Installation the paper, manually set the sensor(Gap & Black-Mark) and Paper Guide to the correct position.

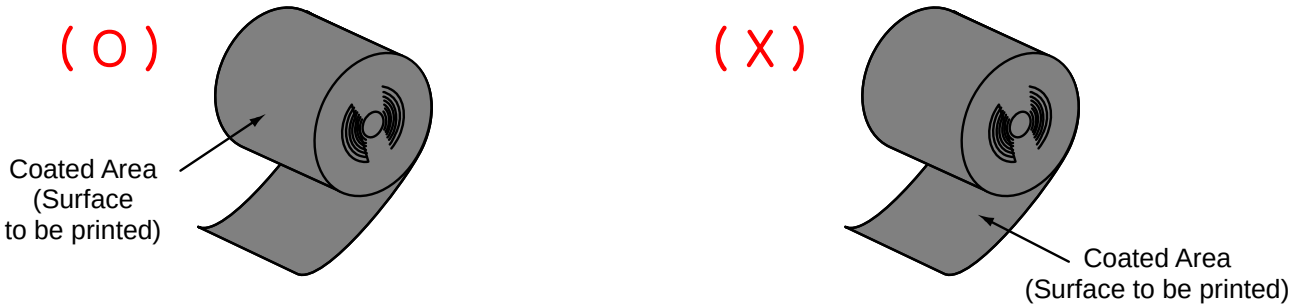


6) Close the Ribbon Assembly until a click sound is heard, close the Paper Cover.

2-1-5 Ribbon Installation

1) Type of Ribbon

(1) Type by Film Coating Location
- Take note before ribbon purchase that only ribbons facing outward can be used.



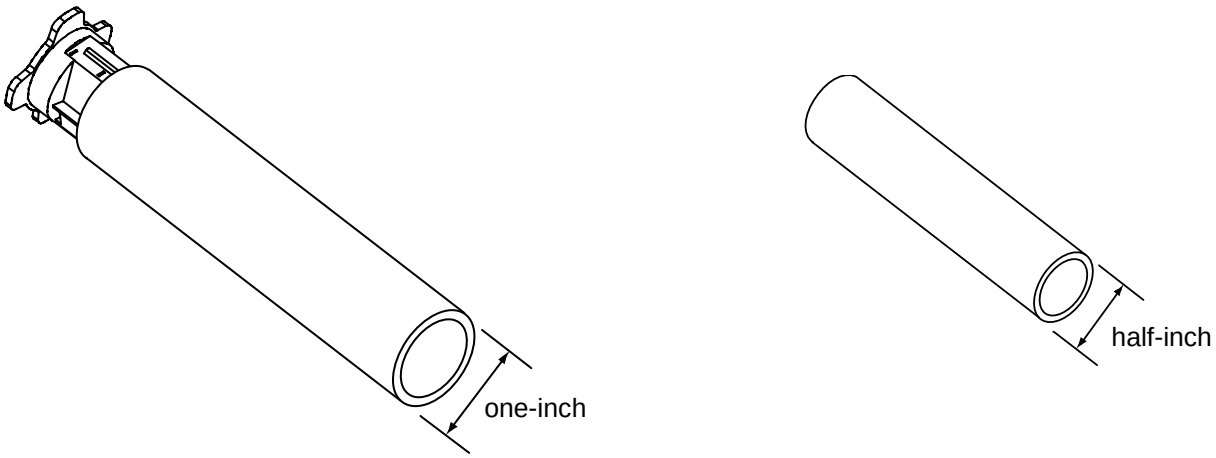
Outside Ribbon　　Inside Ribbon

※ Note
- Follow the procedure described below to determine the coating surface of the ribbon.

• Ribbon test using adhesive material
- Perform contact test in order to determine which side is coated if there are useable labels.

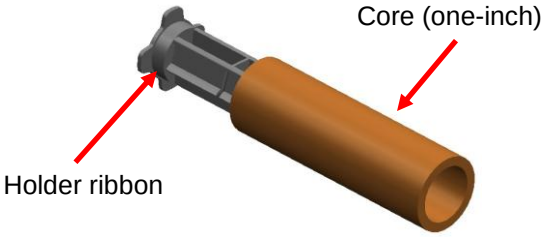
• Complete the following steps to carry out the contact test
- Remove the liner from the label
- Put a piece of adhesive surface of the label on the outer/inner surface of the ribbon, and apply pressure.
- Remove the label from the ribbon
- Check whether adhesive surface of the label is stained by black ink ribbon.

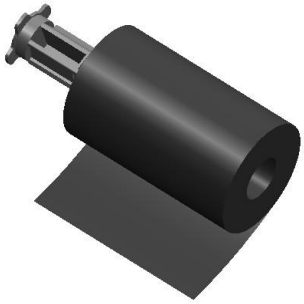
(2) Type by Roll Core
- This printer can be used to one-inch or half-inch core ribbon.
- For a 1-inch core, a roll core must be used.
- Take care not to misplace the ribbon holder and do not discard it as it is an item that is subject to continuous use.



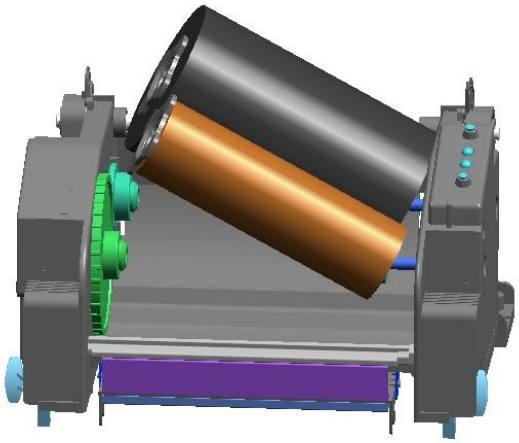
2) Inserting a One-Inch Core Ribbon

(1) Insert the ribbon and core into the ribbon holder. (keep note of ribbon printing direction)

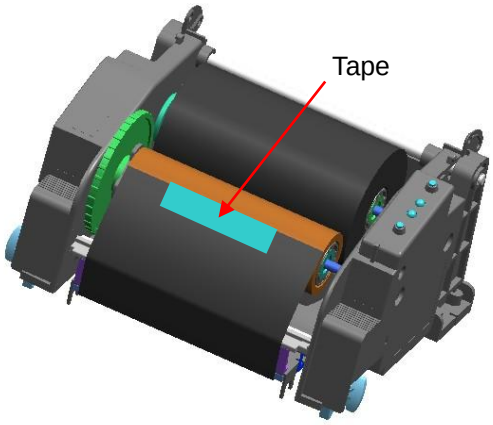




(2) Open the ribbon assembly and insert the ribbon and core by pushing from left to right.



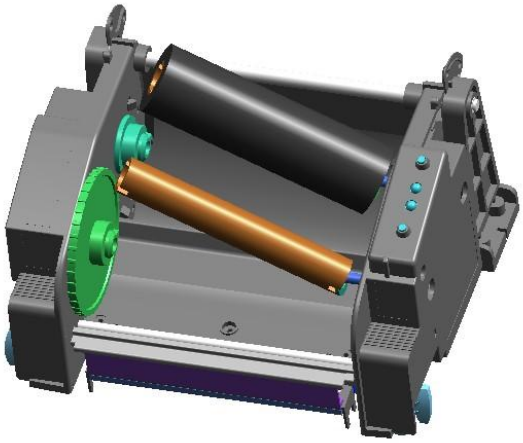
(3) Apply tape to the coiling portion of the ribbon.



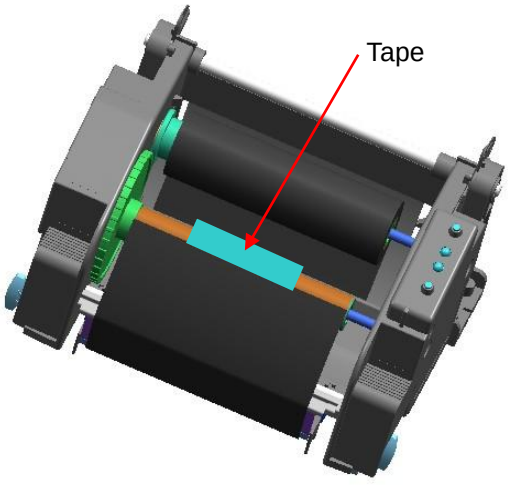
(4) Press the Close area to shut the ribbon assembly.

3) Inserting a Half-Inch Core Ribbon

(1) Open the ribbon assembly and insert the ribbon and core by pushing from left to right.
(keep note of ribbon printing direction)



(2) Apply tape to the coiling portion of the ribbon.

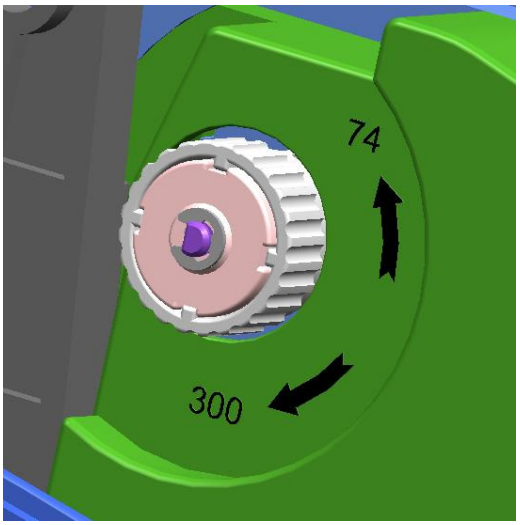


4) Knob Adjustment by Ribbon Length

Ribbon lengths of 74m, 100m (0.5" core), and 300m (1" core) can all be used with this product. Adjust the knob accurately according to the ribbon length (74 ~ 300 m).
Exercise care as print quality can be affected.

(1) The product is shipped with a default setting for a ribbon length of 300m (1" core). To use a 74m (0.5" core) ribbon, adjust (rotate) the knob in the direction of 74m prior to use.

(2) When the knob and cover are level as shown in Image A, the ribbon length is set to 74m. If the cover is inside the knob as shown in Image B, the ribbon length is set to 300m.



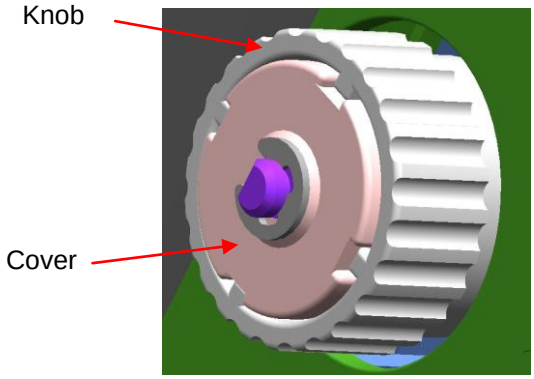


Image-A (74m)

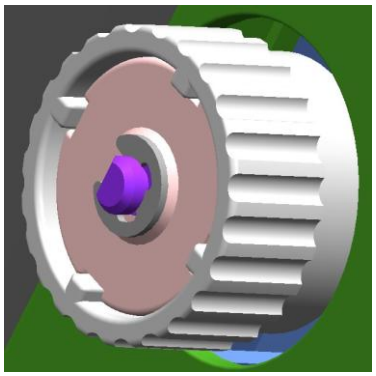
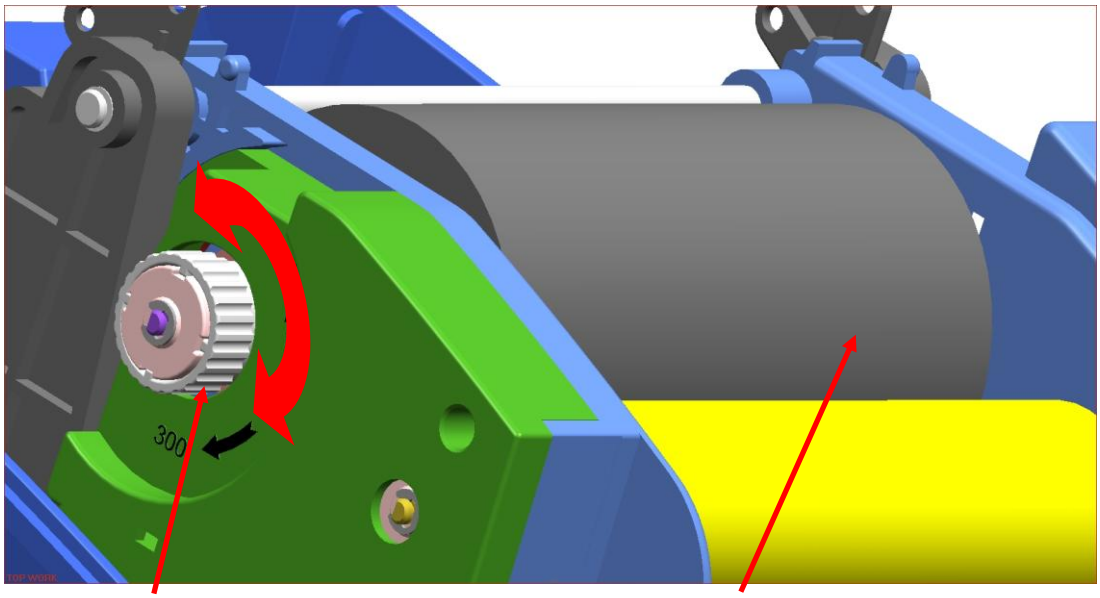


Image -B (300m)

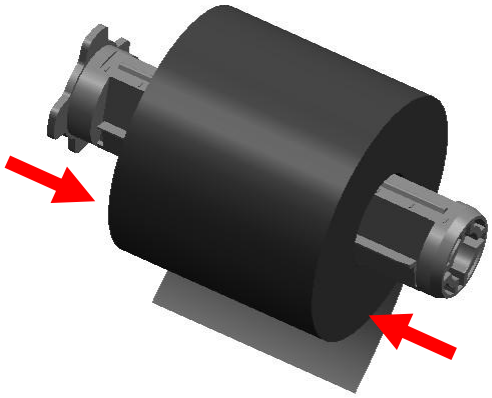
■ Knob Adjustment

- Grasp the ribbon while it is fitted and rotate the knob as shown in the image.



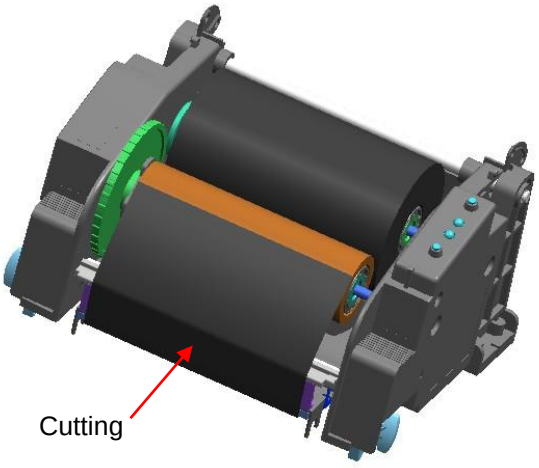
5) Narrow Ribbon Installation

When using ribbons of widths of 110mm or lower, install in a centered position on the holder.



6) Ribbon Removal

(1) Use a knife or other sharp-edged object to cut the ribbon.(Take care not to injure hands)
(2) Open the ribbon assembly and remove the ribbon and core by pushing from left to right.
(3) Detach the ribbon holder from the ribbon and core.



7) Ribbon Sensor Activation

To activate the ribbon sensor, check to see if the dip switch is properly set. (Refer to dip switch table)
If the ribbon sensor is inactive, detection of low ribbon levels and/or disconnected ribbons is not possible.

※ CAUTION

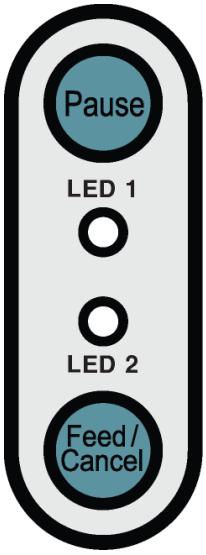
- When replacing a ribbon, keep affixed the core of the fully used ribbon to the ribbon coiling portion on the other side and do not discard as its use is required.
- As the ribbon holder is required for continuous use, make sure not to misplace it.

2-2 Operation

2-2-1 Using the operation panel

Most of the functions of this printer are governed by software, but you can monitor the printer s status by looking at the lights on the control panel and for some procedures you will use the buttons.

• Control panel



2-2-2 Button Operations

Printer state before operation	Button		Operation procedure	Printer operation mode
	Feed/ Cancel	Pause		
Power OFF	Press	-	• Apply power while pressing the button. • Hold the button for about five seconds.	Self-test Printing Mode.
Print Standby	Press	-	• Press the button softly and release it immediately	Feed Mode
Print Standby	-	Press	• Press the button for two seconds and continue to hold	Stand-alone configuration Mode
During printing	Press	-	• Press the button softly and release it immediately	Print Cancel Mode
During printing	-	Press	• Press the button softly and release it immediately	Print Pause Mode

2-2-3 LED indicator for various printer statuses

LED 1		LED 2		Printer Status	
Color	Status	Color	Status		
Green	On	Green	On	Print standby mode	Print standby mode
Red	On	Red	On	Error mode	Ribbon is not detected
Red	On	Orange	On	Error mode	Paper jam (gap/black mark is not recognized)
Red	On	Green	Blink	Error mode	Printer head overheating
Red	On	Red	Blink	Error mode	Cover open
Red	On	Orange	Blink	Error mode	No paper
Red	On	-	Off	Error mode	Media calibration failure
Red	Blink	Red	Blink	Error mode	Auto-Cutter error
Orange	On	Orange	On	Mode switching notification	Mode switching notification
Green	Blink	Red	On	Wait for input	Print is paused temporarily. Wait for button input
Green	Blink	Green	Blink	Wait for input	Cover Close Mode. Wait for button input
Green	On	Red	Blink	Wait for input	Print Cancel Mode. Wait for button input

2-2-4 Test Printing using Windows driver

1) Install the Windows driver.
Refer to the “Windows driver manual” in the CD for the installation procedure.

2) Set the “port” of Windows driver to the appropriate interface to be used. Refer to the “Ethernet interface user’s manual” in the CD when using Ethernet interface.

3) Print the test page using the “Print test page” function of Windows driver.

2-2-5 Test Printing Label design program

- The label design program is included in the separate CD.

1) Install the label design program.

2) Refer to the “Label Design Program Manual” included in the CD and set the interface.

3) Print the test page after designing a label.

2-2-6 Self-Test

The self-test checks whether the printer has any problems.

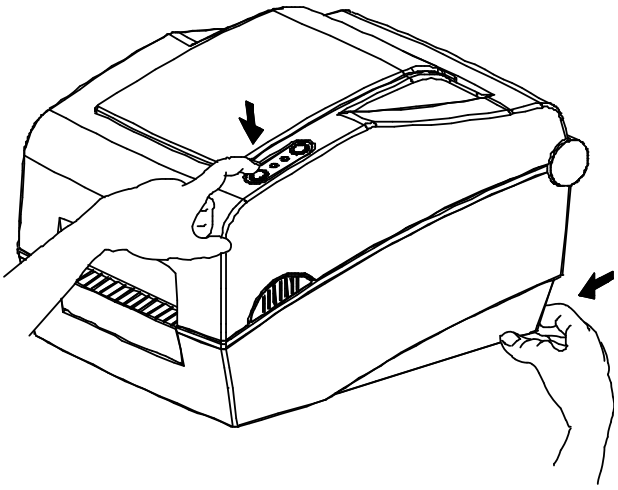
- Firmware version, printer configuration information, printing quality checking pattern, and peripheral configuration information, etc.

Users cannot perform this procedure if using the printer's label peel-off option.
If the printer does not function properly, contact an authorized dealer.

The self-test checks the following;

1) Make sure that the paper roll has been installed properly.

2) Turn on the power while pressing the feed button then self-test will begin.
(Hold the button for about five seconds)



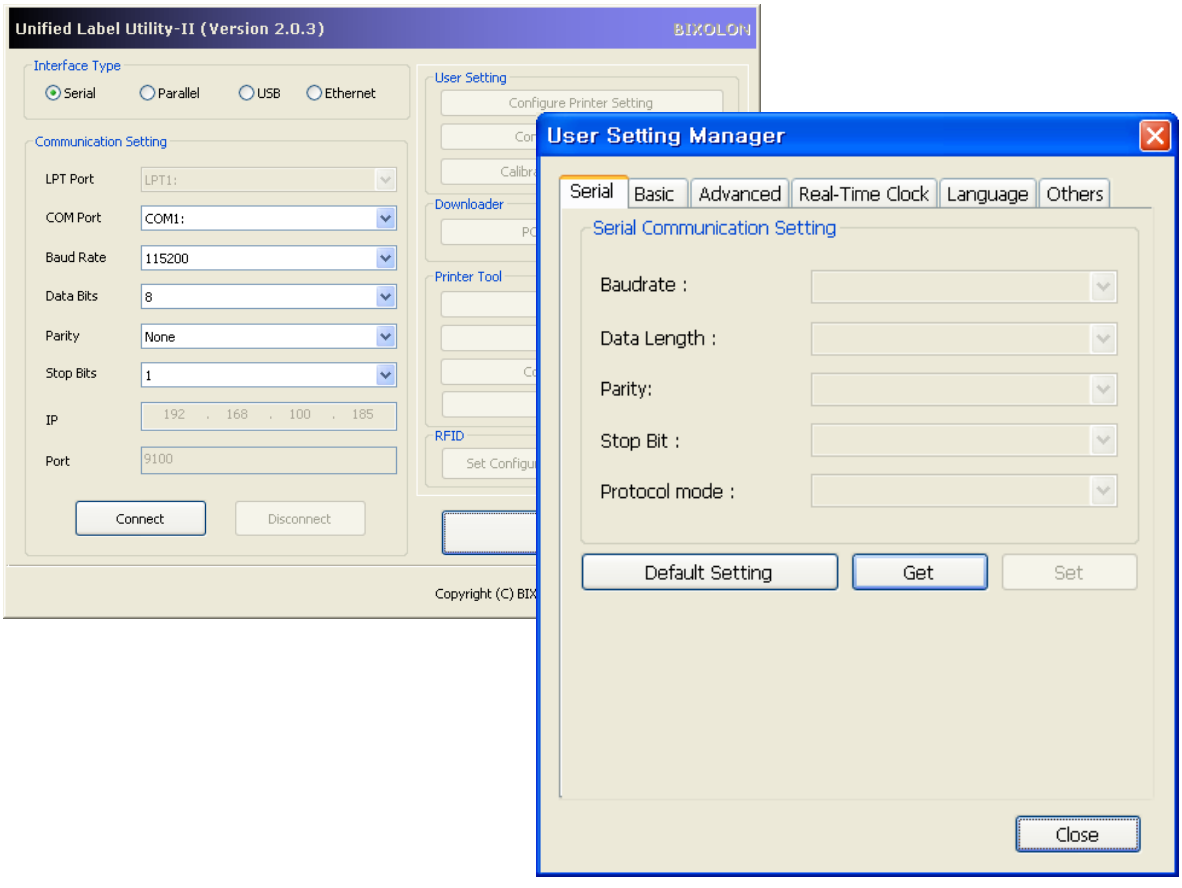
2-2-7 Printer setting using utility program

Various printer settings can be changed using the utility program (Unified Label Utility).

Functions that can be used with the utility program are as follows.

1) Serial communication settings
   Handshake, Stop bit, Data bit, Parity, and Baud rate can be configured.
2) Basic printer settings
   Paper size, printing speed and density, paper type, and use of ribbon can be configured.
3) Language setting
   Code page can be configured.
4) Media sensor manual calibration function
   This function can be used to detect special type or special material paper that is not detected through automatic calibration function. Refer to M Manual Calibration page for more details
5) Other functions for printer test are also provided.

Refer to the “United Label Printer Utility Manual” contained in the CD for more detailed information.



2-2-8 Stand-alone Configuration Mode

Various modes can be executed using buttons and LED only.

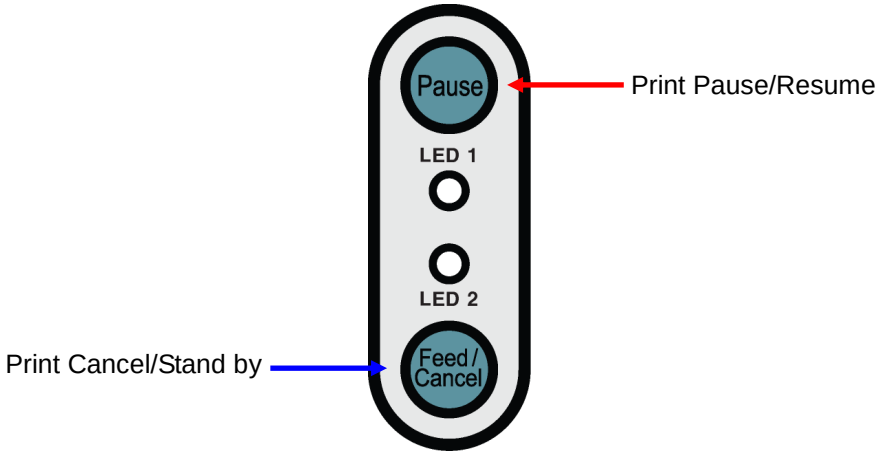
1) How to start stand-alone configuration mode
- The printer mode is set to Printer Setting Mode when the Pause button is pressed for two seconds while in Print Standby Mode.
- Both LEDs will change to orange color and the printer will be set to Stand-along Configuration Mode.
- When the printer enters into this mode, the status of LED 1 and LED 2 are changed sequentially.
- When the Feed button is pressed at specific LED color combination, the corresponding printer operation will be selected.

2) List of supported functions

Sequence number	LED 1		LED 2		Printer operation
	Color	Status	Color	Status	
1	Green	On	Green	Blink four times	Print Configuration Info.
2			Orange	Blink four times	Print File List
3			Red	Blink four times	Factory Reset
4	Orange	On	Green	Blink four times	Gap Sensor Auto Calibration
5			Orange	Blink four times	B/M Sensor Auto Calibration
6			Red	Blink four times	Data Dump Mode
7	Red	On	Green	Blink four times	Demo Mode
8			Orange	Blink four times	Change to Line Mode
9			Red	Blink four times	Download Items Delete

2-2-9 Pause/Cancel

During multiple-page print jobs, the Pause and Cancel button can be used to temporarily cease printing and cancel the print job altogether, respectively.



1) Pause/Resume Function

① When printing labels, pressing the Pause button

② The printer will pause after finishing the current label printing and the status of LED will be as follows.
- LED 1: Green Blink
- LED 2: Red On

③ While the print job is paused, press the Pause button again to resume printing.

2) Print Cancellation

①During label printing and/or pause mode, pressing the Cancel button enters the print cancellation mode.

②The following processes occur in the print cancellation mode.
- All label printing cancelled
- All data received in the printer communications buffer deleted.
- All received data deleted.

③The LED Status in the print cancellation mode can be as follows.
- LED 1: Green On
- LED 2: Red Blinking

④ While in the print cancellation mode, press the Cancel button again to return to print standby mode.

2-2-10 Media Calibration

This printer has been designed to recognize the gaps with most print papers, but sometimes it may not recognize the gap and keep feeding paper if a special type of paper is used. In this case, run Auto Calibration function so that the printer can recognize the gap. BIXOLON printer provides various media calibration methods in order to accommodate various special paper types.

1) About media calibration
- This function is for adjusting the sensitivity of the paper detection sensor for accurate printing position control and measuring actual length of paper.
- Sensor sensitivity adjustment
  - The purpose is to detect the identifier (gap/black mark/groove) of installed label printer
- Paper length measurement
  - Accurate length is required to rotate the printing orientation.
  - The purpose is to detect the change of paper type.

2) When is media calibration required?
- When the printer is installed first time
- When the newly installed paper is a different paper type
- When printer position is not accurate or printer does not stop in the right position

3) How to perform media calibration
- The following four methods of media calibration can be used depending on the conditions.
  - Smart Media Detection
  - Gap Sensor Auto Calibration Mode
  - Black Mark Sensor Auto Calibration Mode
  - Manual Calibration Mode
- Why are several calibration methods provided?
  - Multiple labels should be scanned for media calibration and more accurate sensitivity calibration can be performed when more labels are scanned.
  - The number of labels to scan for sensor sensitivity adjustment depends on various conditions such as label paper material, color, surface status, thickness, gap length, pre-printed pattern, etc.
  - Four different media calibration modes are provided for compromise between prevention of excessive use of paper and accuracy of sensor sensitivity adjustment.
  - Smart media detection mode that allows for adjustment of sensitivity with minimum amount of scanning should be good enough for most cases with general labels.
  - Try various methods in order of Smart Media Detection → Gap Sensor Automatic Calibration → Black Mark Sensor Automatic Calibration → Manual Calibration Mode.

2-2-11 Smart Media Detection

- Printer executes this function when necessary without user input and media configuration can be completed with Smart Media Detection function for most print papers.
- Papers with gap and black mark can be identified without separate settings.
- 3 ~ 5 pages of labels will be used depending on the type of paper.
- Smart Media Detection function is executed in the followings cases
  - When the printer is installed first time, it is executed through Feed button or print command.
  - When change paper length is detected during feeding or printing.
  - When the paper type entered by command is different from the configured paper type.
  - After reset with factory settings
- Smart Media Detection function will be turned off after setting the sensor sensitivity using Automatic Calibration Mode or Manual Media Calibration mode, and it will be enabled again after resetting the printer with factory settings.

2-2-12 Gap Sensor Auto Calibration Mode

Use this mode when paper is not detected correctly with Smart Media Detection function.

Printer feeds paper and calibrates Gap Sensor automatically.

The printer will enter error mode if paper detection fails after feeding up to 1 meter of paper. Error mode can be released by opening and closing the cover.

Use Manual Calibration Mode if paper detection fails in this mode.

Smart Media Detection will be disabled if paper detection is successful in this mode.

1) Procedure to run the calibration

- Press the Feed button at 4th LED sequence in 2-2-8 (LED 1 is Orange / LED 2 is blinking Green four times) to start Gap Sensor Automatic Calibration Mode.

2-2-13 Black Mark Sensor Auto Calibration Mode

Use this mode when paper is not detected correctly with Smart Media Detection function.

Printer feeds paper and calibrates Black Mark Sensor automatically.

The printer will enter error mode if paper detection fails after feeding up to 1 meter of paper. Error mode can be released by opening and closing the cover.

Use Manual Calibration Mode if paper detection fails in this mode.

Smart Media Detection will be disabled if paper detection is successful in this mode.

1) Procedure to run calibration

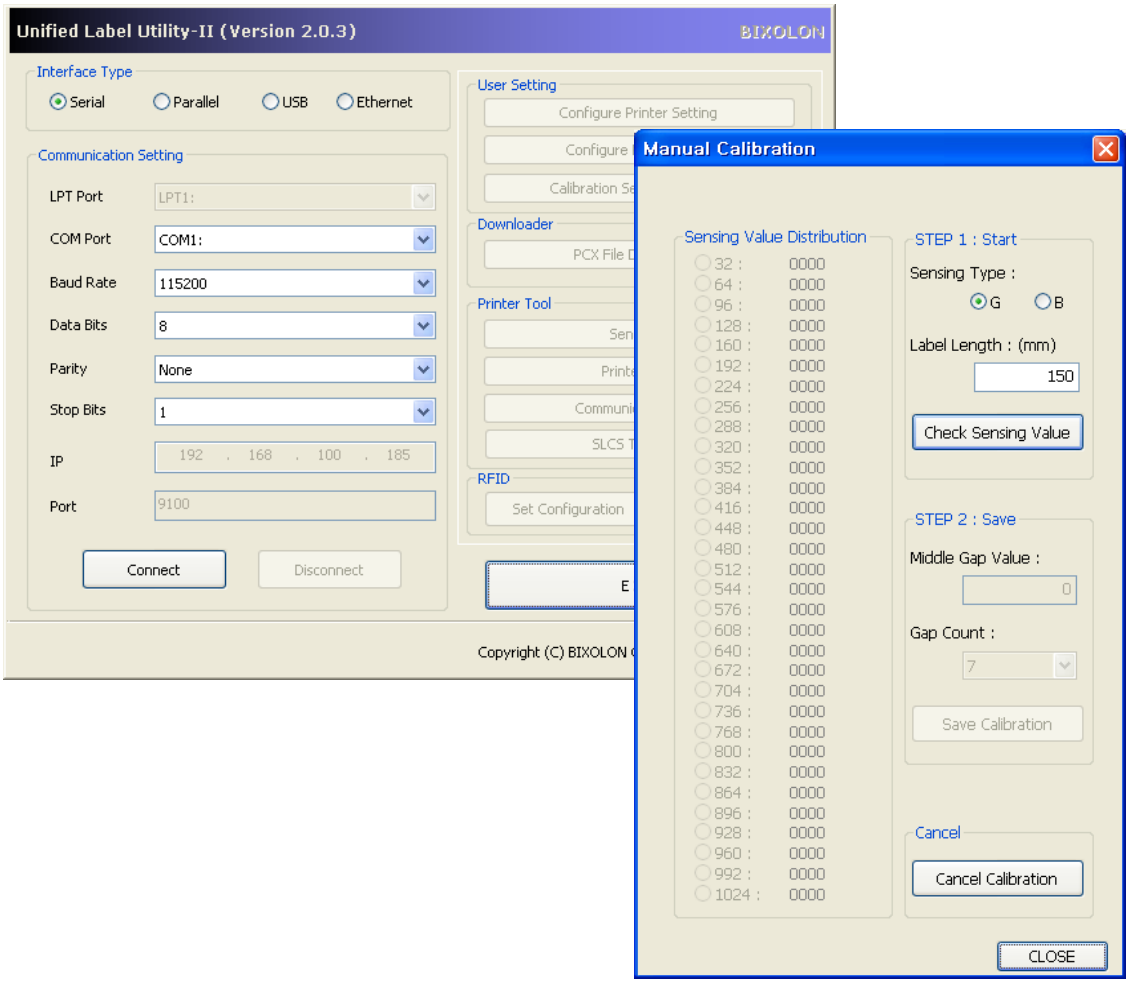
- Press the Feed button at 5th LED sequence in 5-2-2 (LED 1 Orange / LED 2 Orange – Blink four times) to start Black Mark Sensor Automatic Calibration Mode.

2-2-14 Manual Calibration Mode

Manual-calibration of media detection can be used when the printer cannot detect a media gap (or black mark) even after auto-calibration has been executed.

Users can calibrate sensor parameters in detail by using the utility program provided by the manufacturer.

The utility can be obtained from the enclosed CD or downloaded from the Internet via the BIXOLON website www.bixolon.com



Please make sure the printer is connected and execute the utility program.

Please the Calibration Setting Manager Button after setting the interface type.

1) Select the sensing type and input the label length by millimeter and click on “Check Sensing Value” tap. Then printer starts to calibrate.
2) The scanned values will appear on the Utility.
3) Optimal sensing values will appear in black bold letters on the left of the utility screen and select one of the values and click on “Save Calibration”
4) If chosen value does not work properly, please try the other values among the black bold letters.
5) To go back to the initial value, please click on “Cancel Calibration”

2-2-15 Cover Closing Mode

1) About Cover Closing Mode
- The printed area may become out of range of paper if the paper is not in the accurate printing position when the cover is opened and closed.
- The printer is put to Cover Closing Mode instead of Print Standby Mode when the cover is closed in order to prevent this problem, and it waits for user input.
- The status of LEDS are as follows in this mode.
  - LED 1: Green Blink
  - LED 2: Green Blink
- The data received during Cover Close Mode are not printed, and they are printed automatically when the printer recovers to the Print Standby Mode.

2) How to switch the printer from Cover Close Mode to Print Standby Mode
- Press the Pause button to switch to Print Standby Mode without feeding any paper.
- Press the Feed button to feed one page to align the paper position and switch to the Print Standby Mode.

2-2-16 Data Dump Mode

This function can be used to diagnose the communication issues when the printing does not work correctly.

In this mode, the received data are not analyzed and printed, instead they are dumped in hex format without processing.

Turn the printer off and on to recover to the Print Standby Mode.

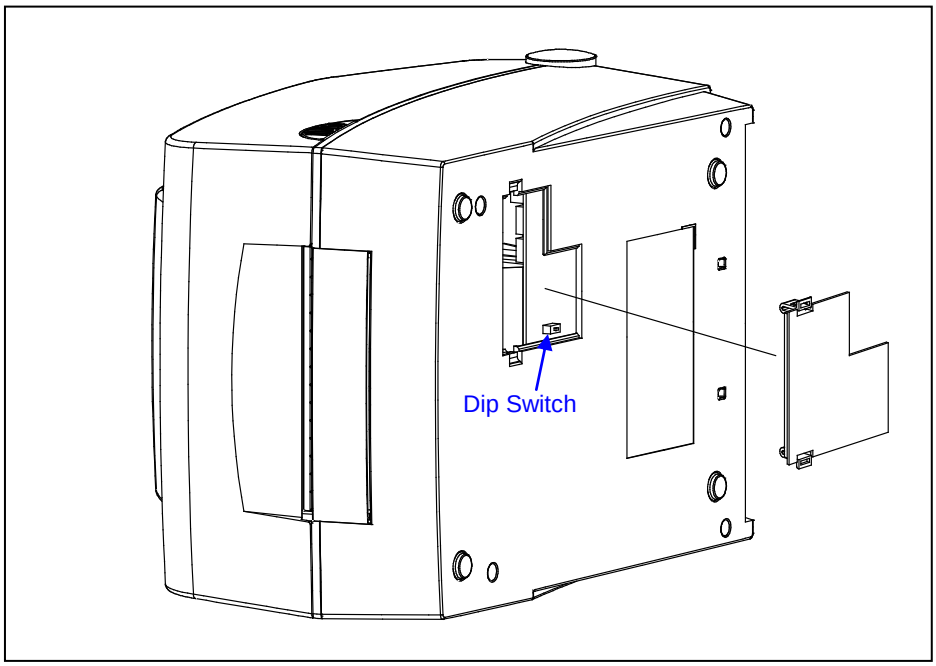
1) How to start Data Dump Mode
① Press the Pause button for two seconds during Print Standby Mode.
② Both LEDs will change to orange color and the printer will be set to Stand-alone Configuration Mode.
③ Press the Feed button at the 6th LED sequence in 2-2-8 (LED 1 is Orange / LED 2 is blinking Red 4 times) to enable Data Dump Mode.

2-2-17 Factory Reset

This function is used to reset the printer settings to factory default settings.

1) How to reset the printer
① Press the Pause button for two seconds during Print Standby Mode.
② Both LEDs will change to orange color and the printer will be set to Stand-alone Configuration Mode.
③ Press the Feed button at the third LED sequence in 2-2-8 (LED 1 is Green / LED 2 is blinking Red 4 times) to reset the printer to factory settings, and Smart Media Detection function will be executed.

2-2-18 Firmware Download



Refer to the “Firmware download manual” in the CD for the installation procedure.

※ CAUTION

Make sure if the dip cover is closed prior to operating.

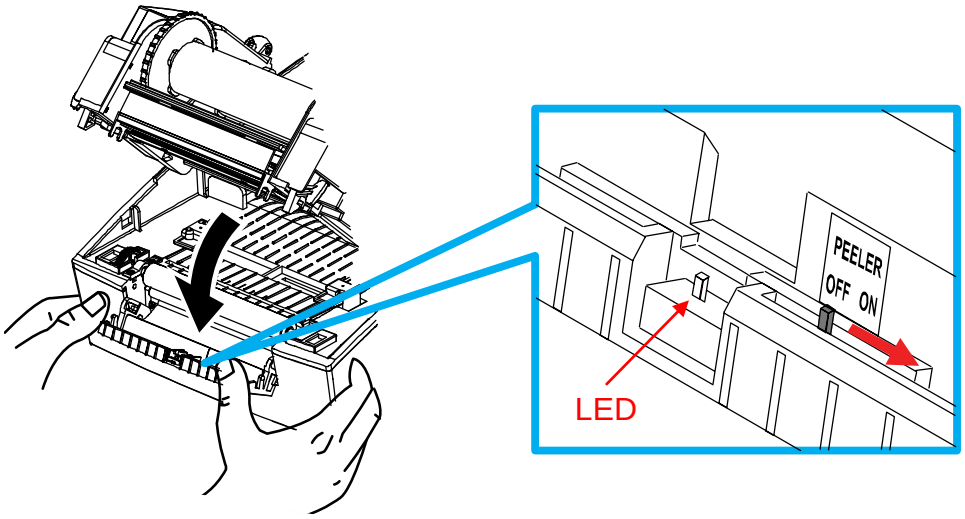
2-2-19 Peel-Off(Option)

As a function that is used to peel-off labels, it is used only with label paper.
(After adjusting the peeler switch, power must be turned off and on in order for the operation to be acknowledged.)

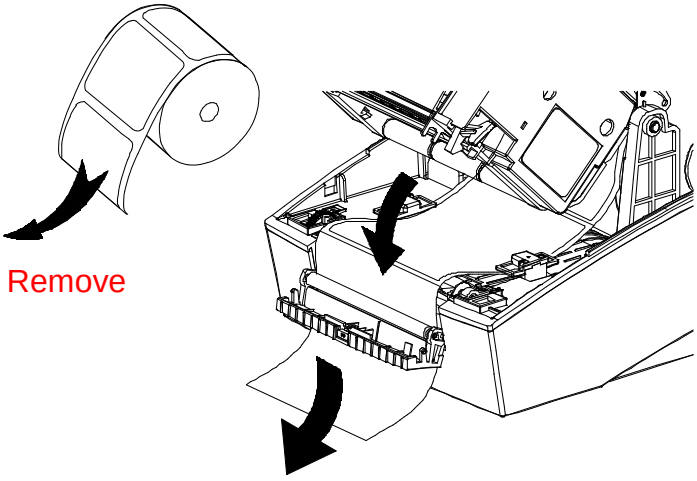
1) Open the Paper Cover.

2) Open the Ribbon Assembly.

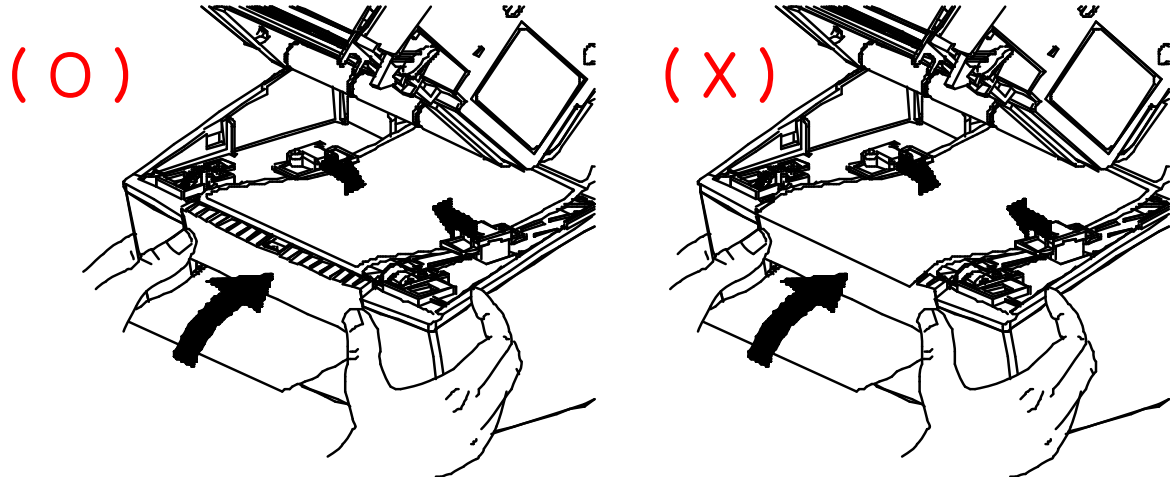
3) Open the label peel-off cover and set the peeler switch to the ON position.
   - Check to see that the LED has turned on.



4) Remove one sheet of the label paper, and insert the paper as shown in the image below.
   - Prior to removing a label, the peeler switch must be set to the ON position.



5) Adjust the paper guides and close the label peel-off cover.



6) Close the Ribbon Assembly until a click sound is heard, close the Paper Cover.

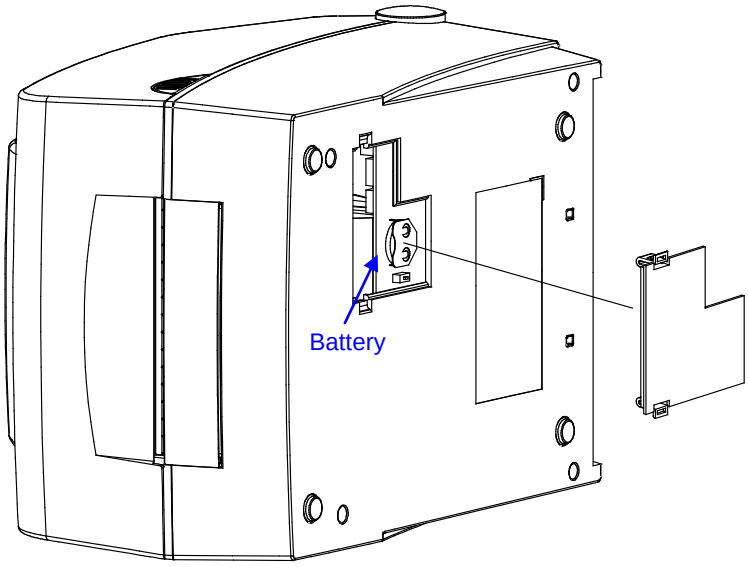
7) Turn the printer off and on.

2-2-20 Real-Time Clock(Option)

As a function that is used to real time clock, can be programmed to print the time and date onto the labels.

- Refer to the “Programming Manual” contained in the CD for more detailed information.

You can discern a low or flat battery if the printer provides a consistently delayed date stamp. Battery replacement must be performed by a qualified service technician.

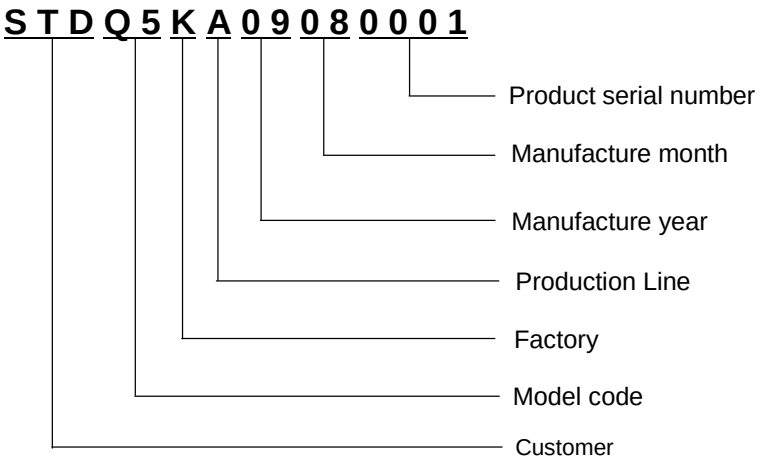


※ CAUTION

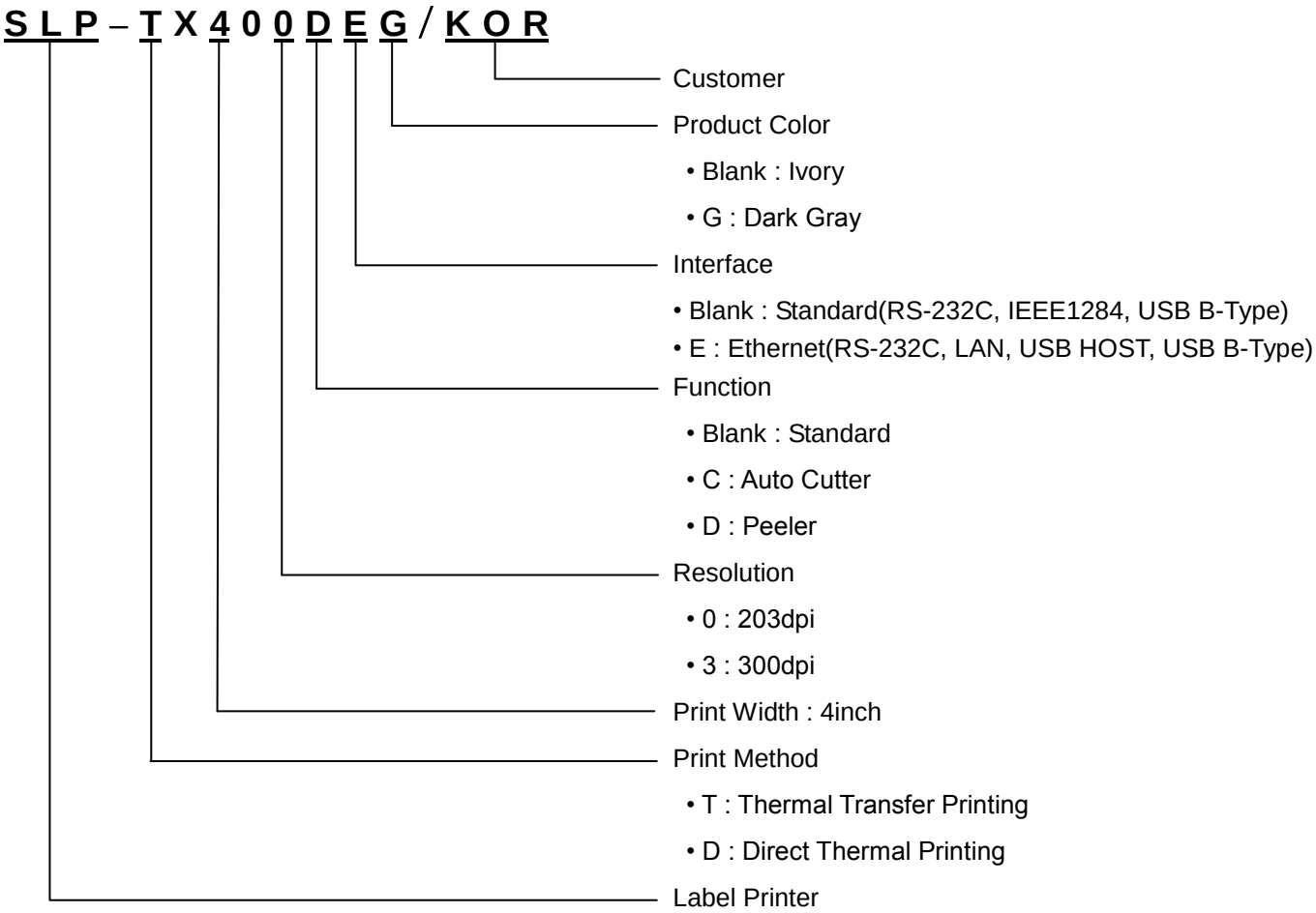
- There is no battery backup for the clock. If one removes the battery, the time will need to be reset.
- Make sure if the dip cover is closed prior to operating.

3. Specification

3-1 SET Identification number application method After Mar 2008



3-2 Printer Classification



No	Model Name	Color	Resolution	Option	Remark
1	SLP-TX400	Ivory	203dpi	Standard	
2	SLP-TX400C			Auto-Cutter	
3	SLP-TX400D			Peeler	
4	SLP-TX400E			Ethernet	
5	SLP-TX400CE			Auto-Cutter, Ethernet	
6	SLP-TX400DE			Peeler, Ethernet	
7	SLP-TX403		300dpi	Standard	
8	SLP-TX403C			Auto-Cutter	
9	SLP-TX403D			Peeler	
10	SLP-TX403E			Ethernet	
11	SLP-TX403CE			Auto-Cutter, Ethernet	
12	SLP-TX403DE			Peeler, Ethernet	
13	SLP-TX400G	Dark Gray	203dpi	Standard	
14	SLP-TX400CG			Auto-Cutter	
15	SLP-TX400DG			Peeler	
16	SLP-TX400EG			Ethernet	
17	SLP-TX400CEG			Auto-Cutter, Ethernet	
18	SLP-TX400DEG			Peeler, Ethernet	
19	SLP-TX403G		300dpi	Standard	
20	SLP-TX403CG			Auto-Cutter	
21	SLP-TX403DG			Peeler	
22	SLP-TX403EG			Ethernet	
23	SLP-TX403CEG			Auto-Cutter, Ethernet	
24	SLP-TX403DEG			Peeler, Ethernet	

3-3 Appearance

3-3-1 Printer Dimensions(mm)

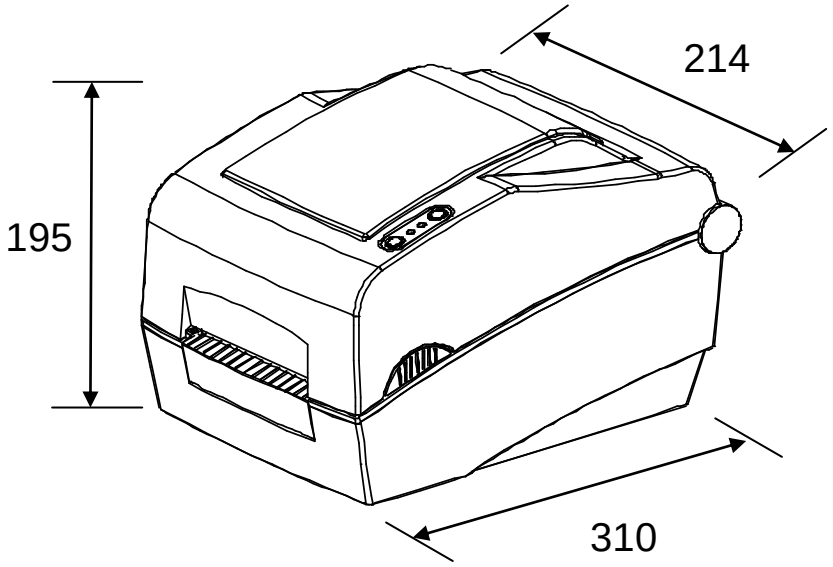


Figure3-1 Printer Dimension

3-3-2 AC/DC Adapter Dimension(mm)

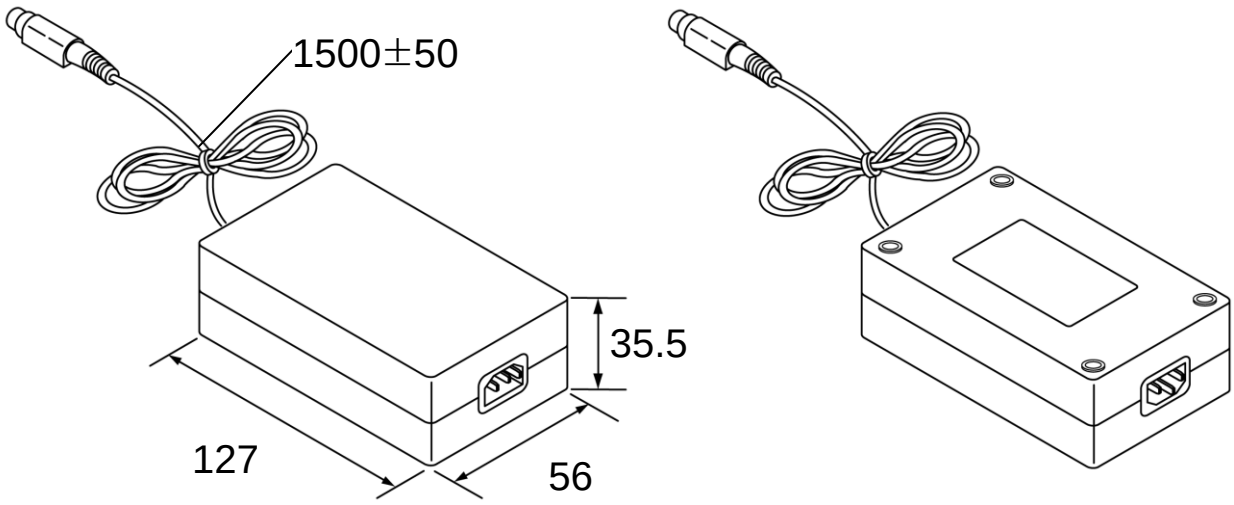
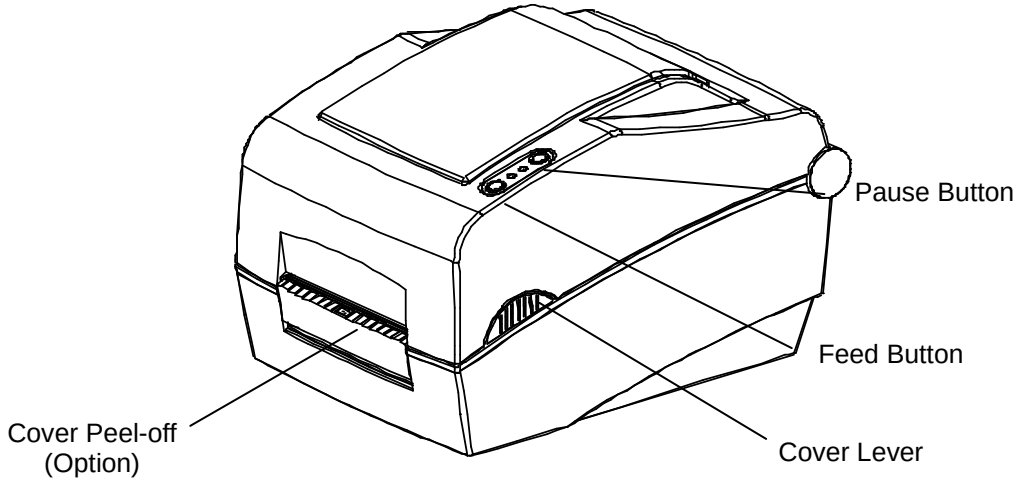
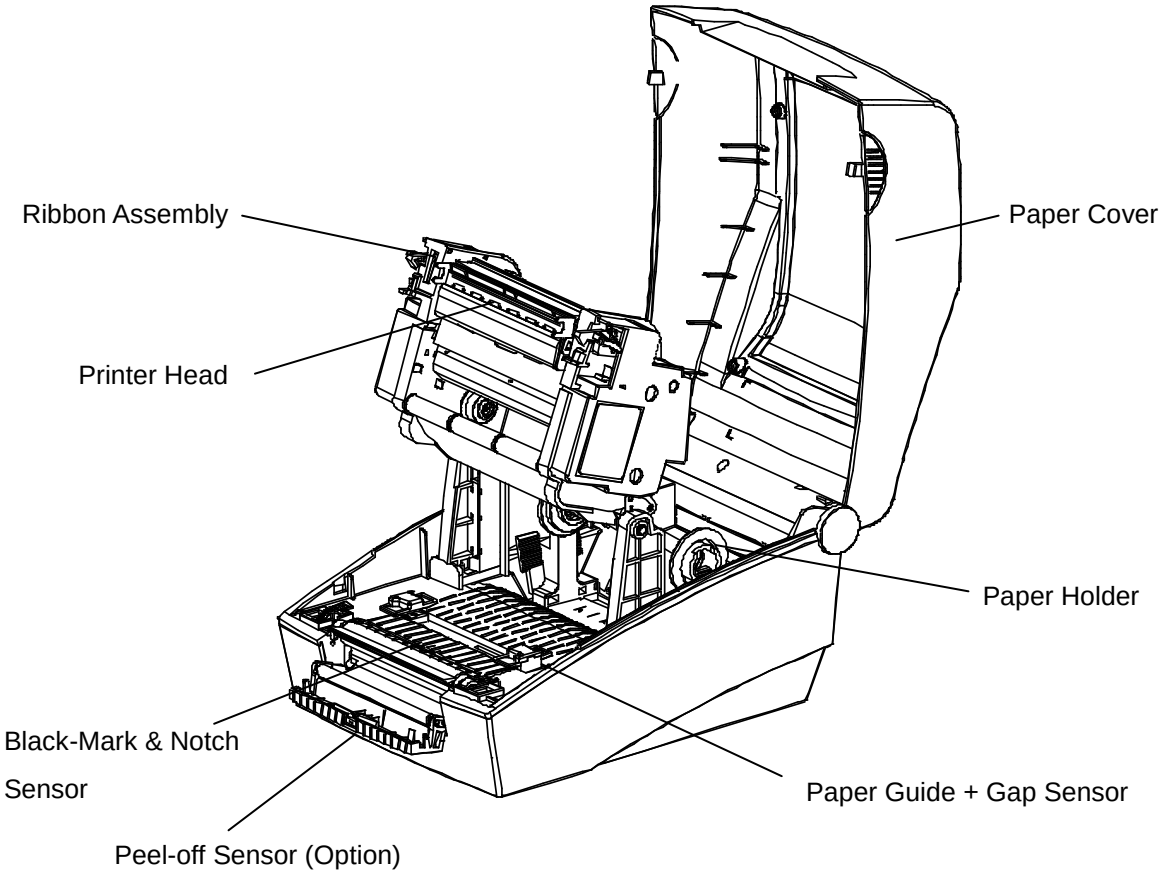


Figure3-2 AC/DC Adapter Dimension

3-3-3 Feature Locations





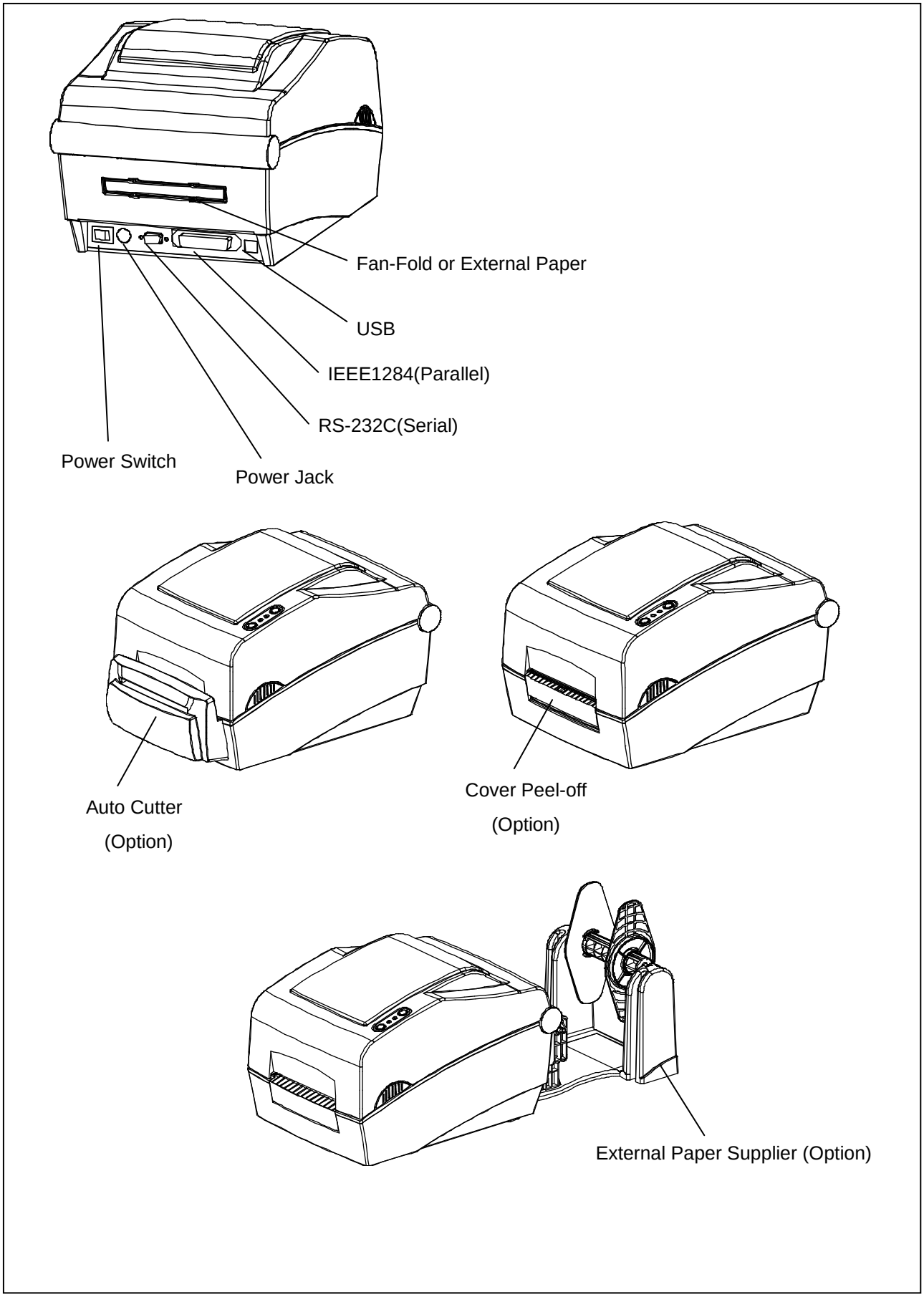


Figure3-3 Feature Location

3-4 General Specifications

3-4-1 Hardware Spec

Item	Description	Remark
Product	SLP-TX400x/TX403x(Thermal Transfer Printing)	
Processor	ATMEL AT91SAM9G45B-CU (ARM926EJ-S Core @400MHz) Internal ROM size : 64KB Internal SRAM size : 64KB	
Memory	DDR2 SDRAM : 64MB (W9751G6JB-25) Flash ROM : 128MB (F59L1G81A-25TG)	
Serial Interface (RS-232C)	Flow Control 1) Xon/Xoff (S/W Control) 2) RTS/CTS (H/W Control) Baud Rate : 9,600 / 19,200 / 57,600 / 115,200 bps Receive Buffer : 256KB Connector Type : DB9P(Female), 9P to 9P (1:1 Cable)	
Parallel Interface	Mode 1) SPP Mode 2) ECP Mode 3) EPP Mode 4) ECP + EPP Mode 5) Flexible Mode Connector Type : 36 Pin Centronics	
USB Device	Version : V2.0 Transfer Type : BULK Speed : Hi-Speed, 480Mbps Power : Self-powered Connector Type : USB B type	
USB HOST (WLAN)	Version : V2.0 Transfer Type : BULK Speed : Hi-Speed, 480Mbps Power : Self-powered(Current Limiting : 0.5A) Connector Type : USB A type	
Ethernet Interface	Network : 10/100 Base-T, Auto Detection Protocol : TCP, UDP, IP, ICMP, ARP Flow Control : Hardware(RTS/CTS)	
Auto Cutter	Cutting Method : Full Cut (0.3 Million Cut_Max. 0.18mm)	User Option
Printing Method	Thermal Transfer Printing	
Printing Speed	SLP-TX400 : Max. 178 mm/sec (Max. 7ips) SLP-TX403 : Max. 152 mm/sec (Max. 6ips)	
Power Consumption	Approx. 55 W	
AC/DC Adapter	Input : AC100~240V 50/60Hz 1.5A Output : DC24V, 2.5A Efficiency Level : V	Peak Load : 13A
Environment Condition	Operating Temperature : 5°C ~ 40°C Storage Temperature : -20°C ~ 60°C Operating Humidity : 10% ~ 80% RH (no Condensation) Storage Humidity : 10% ~ 90% RH (no Condensation)	
Weight	2.75kg(without Packing)	5.7kg(with Packing)
Dimensions(mm)	214(W) × 310(D) × 195(H)	

3-4-2 Function Spec

Function	Description	Remarks
Text Printing	Multiply, Bold, Reverse and Rotation functions	
1D Barcode Printing	Various barcodes supported Rotation, HRI supported.	
2D Barcode Printing	Various barcodes supported Rotation. HRI supported	
Block Printing	Line, Box, Slope and Circle printing supported Overwrite, Exclusive OR, Delete mode supported	
Graphic	PCX. BMP Save, Load & Printing, Delete function supported	
Font download	Bitmap Font Download Vector Font Download	
Template	The label format can be stored in the printer and can be reused. Variable and Counter can be used in template.	
Variable	Total 100 variables supported Can be used in Data field of Text & Barcode. Left, center and right justification	
Counter	Total 10 counters supported Maximum 27 field size. + counting or – counting. Can be used in Data field of Text & Barcode. Left, center and right justification	
Double Buffering	Make next image buffer while printing present image buffer	
Multi Printing	Copies and Set function supported.	
Label size setting	Label size can be set by user regardless of label media size.	

3-5 Thermal Printer Specification

3-5-1 Printer Specification

Item	Description	Remark
Model	SLP-TX400x (TPH : KRC-108-8TAO1 , Kyocera) SLP-TX403x (TPH : KRC-106-12TAO1 , Kyocera)	
Printing Method	Thermal Transfer Printing	
Resolution	SLP-TX400x : 203dpi (8dots/mm) SLP-TX403x : 300dpi(11.8dots/mm)	
Printing Direction	Unidirectional with friction feed	
Printing Width	SLP-TX400x : Max. 108mm (864 dot position) SLP-TX403x : Max. 105.7mm(1248 dot position)	
Printing Speed	SLP-TX400x : Max. 178 mm/sec (Max. 7ips) SLP-TX403x : Max. 127 mm/sec (Max. 5ips)	

3-5-2 Character Specification

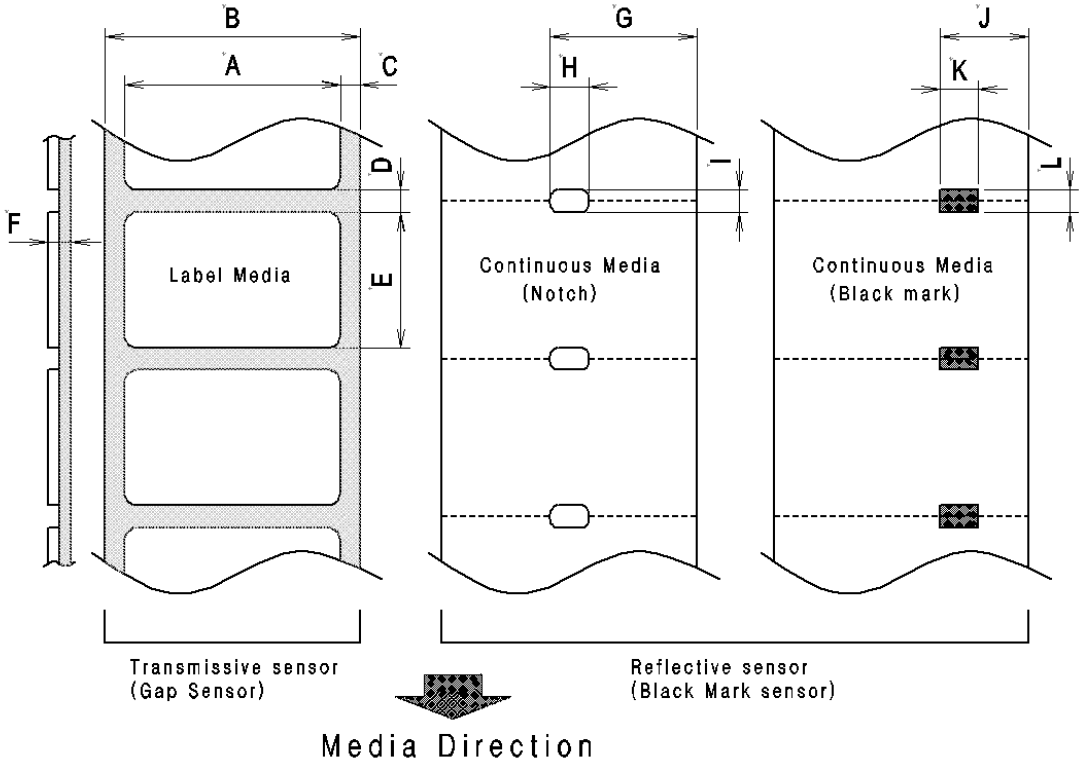
Item	Description		Remark
Number of Character	Alphanumeric Characters : 95(except space)		
	Extended Characters : more than 23 code pages		
	International Characters : more than 32 code pages		
Fonts	6 pt : 9dot × 15dot 8 pt : 12dot × 20dot 10 pt : 16dot × 25dot 12 pt : 19dot × 30dot 14 pt : 22dot × 34dot 15 pt : 24dot × 38dot 18 pt : 28dot × 44dot 20 pt : 32dot × 50dot 24 pt : 37dot × 58dot 30 pt : 48dot × 76dot Vector Font : Scalable	KOR 1 : 16 × 16 KOR 2 : 20 × 20 KOR 3 : 20 × 26 KOR 4 : 24 × 24 KOR 5 : 26 × 26 KOR 6 : 38 × 38 GB2312 : 24 × 24 BIG5 : 24 × 24 Shift JIS : 24 × 24	Each size of font can be enlarged to max 4 times.

3-5-3 Barcode Specification

Item	Description	Remark
1D Barcodes	EAN-8, EAN-13, Code11, Code39, Code49, Code93, Code128, Code128 with subsets A/B/C/AUTO, I 2 of 5, ITF, Coda Bar, UPC-A, UPC-E, IMB, Planet, Plessy, Postnet, Logmars, TLC39	
2D Barcodes	PDF417, Micro-PDF417, QR code, Maxicode, Datamatrix, Aztec	

3-5-4 Paper Specification

Item	Description	Remark
Paper Type	Label, Tag, Linerless(option)	
Paper Form	Fan-Fold , Continuous, Gap, Notch, Black Mark	
Wound Type	Outside & Inside	
Paper Roll Size	Max Φ130mm(5.1 inch), Max Φ220mm(8.6 inch) : External Supply_option	
Core ID	Φ25.4 ~ Φ38.1mm(1~1.5inch), Φ25.4 ~ Φ76.2mm(1~3inch) : External Supply_option	



Index	Item	Specification		Sensor Type
		Min.	Max.	
A	Label width	25	116	-
B	Liner width	25	116	-
C	Label right Gap	0	5	Gap sensor
D	Length of Gap between labels	2.5	30	Gap sensor
E	Label length	6	1000	Gap sensor
F	Total media thickness	0.06	0.2	-
G	Notch position	15	110	Black mark sensor
H	Notch width	5	110	Black mark sensor
I	Notch length	2.5	30	Black mark sensor
J	Black mark position	15	110	Black mark sensor
K	Black mark width	5	116	Black mark sensor
L	Black mark length	2.5	30	Black mark sensor

3-5-5 Ribbon Specification

Item	Description	Remark
Ribbon Type	Wax, Wax/Resin, Resin	
Wound Type	Ink Outside	
Ribbon Width	33~110mm(1.3~4.3inch)	
Ribbon Length	Max. 300m	
Ribbon Roll Size	Max. Φ65mm(2.5inch)	
Core ID.	12.5mm(0.5inch), 25.4mm(1inch)	

3-5-6 Warranty and Environment Specification

Item	Description	Remark
Printer Unit	12 Month	
Head	Pulse durability : 1 ×10^8 pulses min Abrasion resistance : 6 Month / 25Km (Average resistance drift : -15%≤ΔRav/Rav≤+15%)	Printing ratio 12.5%
Auto Cutter	0.3 Million(Paper Thickness Max. 0.18mm)	User Option
Environmental Temperature	Operating : 5°C ~ 40°C Storage : -20°C ~ 60°C	
Humidity	Storage : 10% ~ 90% RH (no Condensation)	

3-5-7 TPH(Thermal Printer Head) Specification

Item	Description	Remark
Head Element Structure	2 Heaters / Dot	
Number of Heat Element	203dpi : 862 dots 300dpi : 1248 dots	
Heat Element Pitch	203dpi : 0.125 mm/dot(8dots/mm) 300dpi : 0.0847 mm/dot(11.8dots/mm)	
Print Width	203dpi : 108mm ±0.2mm 300dpi : 105.7mm ±0.2mm	
Average Resistance	203dpi : 800Ω ±3% 300dpi : 1500Ω ±3%	
Operating Temperature	0°C ~ 70°C (Thermistor temp. 65°C max.)	

3-5-8 TPH Maximum Condition

Item	Maximum Condition	Unit	Condition
Print Cycle(SLT)	0.82	ms/line	Tsub = 25°C
Supply Energy	0.513	mJ/dot	Tsub = 25°C
Supply Voltage	24	V	
Substrate Temperature	65	°C	
Number of Dots to be Energized Simultaneously	448	Dots	
Logic Supply Voltage(Vdd)	3.3	V	
Logic Input Voltage(Vin)	-0.3 ~ Vdd +0.3	V	

3-5-9 Auto Cutter Specification

Item	Description	Remark
Model	ORC-RTG120-2-BX(Full Cut)	
Type	Guillotine Type	
Motor	DC Brush Motor FK-180SH-12280(MABUCHI) with D/V, Insulation Coating (Class A)	
Voltage	24VDC +/-10%	
Current	Peak : 2.6A	

3-5-10 Media Sensor

Item	Description	Remark
Transmission Sensor	Model: KEL-333FA + KST-333FA	Gap sensor
Reflective Sensor(Bottom)	Model: GP2S700HCP	Gap & Black mark sensor
Reflective Sensor(Side)	Model: SG-105F6	Ribbon-end sensor
Reflective Sensor(Top)	Model: SG-105F6	Option(Black mark sensor)

3-5-11 Other Component Specification

Item	Description		Remark
Paper Feed Motor	Model : STP-42H2005 Voltage : 24Vdc	Type : Hybrid Resistance : 3.2Ω	
Cover Open Sensor	Detector S/W Right: DY1140 Detector S/W Left: DY1140 Rating : DC 16V, 1A	Contact Resistance:40mΩ(Max) Operating Force : 70gf (Max)	
Peel Off Sensor	Reflection Type Photo Sensor	Model : HSDL-9100-021	Option

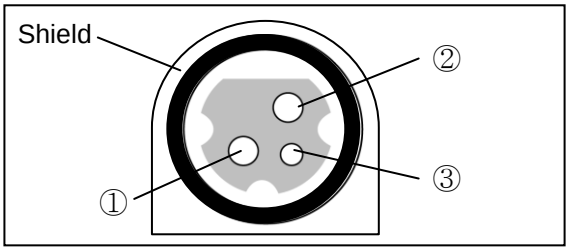
3-6 SMPS Specification

3-6-1 SMPS(Switching Mode Power Supply) Specification

Item	Description	Remark
Input Voltage	Typical : 100V/240V AC Min : 90V AC Max : 264V AC	
Input Current	1.5A Max.@90~264V voltage with max.load	
Output Voltage	+24V ± 5% Initial Tolerance with no load	
Output Current	+24V ± 5%, 0~2.5A (Ipeak=13A)	
Inrush Current	Input fuse and bridge are less than I square (I^2t) energy criteria and no damage at cold-start	
Line Regulation	+24V ± 1% over AC input operating range	
Load Regulation	+24V ± 5% no load to rated load	
Ripple and Noise	±240mV @Iout=2.5A, Resistance load	
S.C.P(Short Current Protect)	Shutdown Mode The shutdown shall be cleared by removal of the short current condition and input power recycling.	
O.V.P (Over Voltage Protect)	Max : 30V	
O.T. P (Over Temperature Protect)	Shutdown Mode The shutdown shall be cleared by removal of the abnormal temp. condition and input power recycling.	
EFFICIENCY	Average 87% (Min.), per CEC method @115/230V(60/50Hz),25~100% load	

3-6-2 SMPS Output Connector

Pin Number	Signal Name
1	+24 VDC
2	GND
3	N.C
Shield	N.C



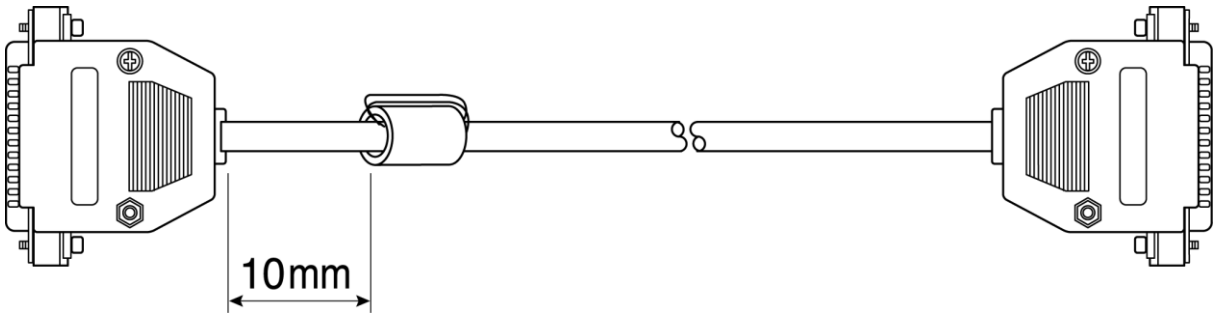
3-7 Interface Specification

3-7-1 RS-232C Serial Interface

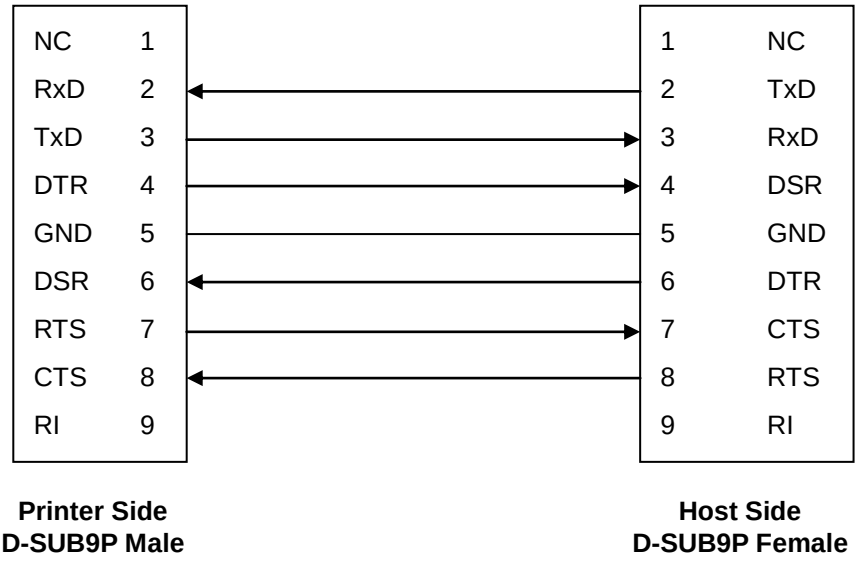
1) Specification

Item	Description	Remark
Data Transmission	Serial	
Synchronization	Asynchronous	
Hand Shaking (Flow Control)	H/W : RTS/CTS S/W : Xon/Xoff	
Signal Level	Logic 1(Mark) : -3V~-15V Logic 0(Space): +3V~+15V	
Baud Rate	9,600 / 19,200 / 38,400 / 57,600 / 115,200 bps	
Data bits length	7 bits/8 bits	
Stop bits length	1 bit/2bits	
Parity	None/Even/Odd	
Connector	9pin – 9pin (1:1 Cable)	

2) RS-232C Cable



3) Cable Connection



4) Signal Description

Signal Name	Signal Direction	Function
Frame GND	-	Frame Ground
TxD	Output	Transmit Data
RxD	Input	Receive Data
RTS	Output	Ready To Send Ready to exchange data
CTS	Input	Clear To Send
DTR	Output	Data Terminal Ready(Almost same function as RTS)
DSR	Input	Data Set Ready(Almost same function as CTS)
Signal GND	-	Signal Ground

5) S/W Flow Control

When Xon/Xoff flow control is selected, the printer transmits Xon(ASCII 11h) or Xoff(ASCII 13h) signal through the TxD line. If the printer is busy, the printer transmits XOFF to host through the TxD line. Then the host recognize that the printer is now busy. So the host does not transmit a data to the printer. If the printer is released from busy state, the printer transmits Xon to host through the TxD line. Then the host recognize that the printer is not busy. And the host can transmit a data to the printer

6) H/W Flow Control

When H/W flow control is selected, the printer checks whether the host is BUSY or not before sending data. If the host is BUSY the printer does not transmit data till the host becomes NOT BUSY.

3-7-2 IEEE 1284 Parallel Interface

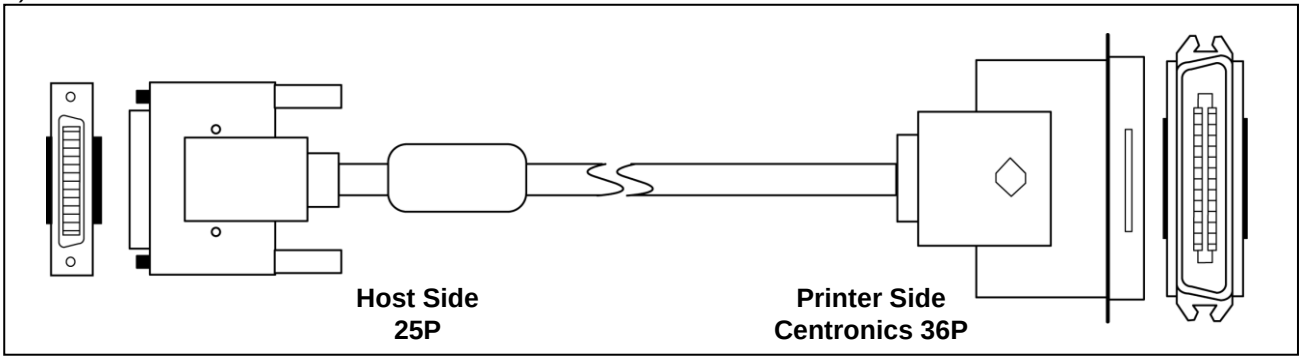
1) Forward Mode Specification(Compatibility mode)
Data transmission from host to printer : Centronics Compatible

Item	Description	Remark
Data Transmission	8-bit Parallel	
Synchronization	External supplied nStrobe signals	
Handshaking	nACK and Busy signals	
Signal Level	TTL compatible	
Connector	Centronics 36P	

2) Signal Specification

Pin No	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	Nstrobe	HostClk	HostClk
2	Host/Printer	Data 0 (LSB)	-	Data 0 (LSB)
3	Host/Printer	Data 1	-	Data 1
4	Host/Printer	Data 2	-	Data 2
5	Host/Printer	Data 3	-	Data 3
6	Host/Printer	Data 4	-	Data 4
7	Host/Printer	Data 5	-	Data 5
8	Host/Printer	Data 6	-	Data 6
9	Host/Printer	Data 7 (MSB)	-	Data 7 (MSB)
10	Printer	Nack	PtrClk	PtrClk
11	Printer	Busy	PtrBusy /Data3,7	PtrBusy
12	Printer	Perror	AckDataReq /Data2,6	AckDataReq
13	Printer	Select	Xflag /Data1,5	Xflag
14	Host	NautoFd	HostBusy	HostBusy
15		NC	ND	ND
16		GND	GND	GND
17		FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19~30		GND	GND	GND
31	Host	Ninit	Ninit	Ninit
32	Printer	Nfault	nDataAvail /Data0,4	nDataAvail
33		GND	ND	ND
34	Printer	DK_Status	ND	ND
35	Printer	+5V	ND	ND
36	Host	NselectIn	1284-Active	1284-Active

3) IEEE1284 I/F Cable



3-7-3 USB Interface

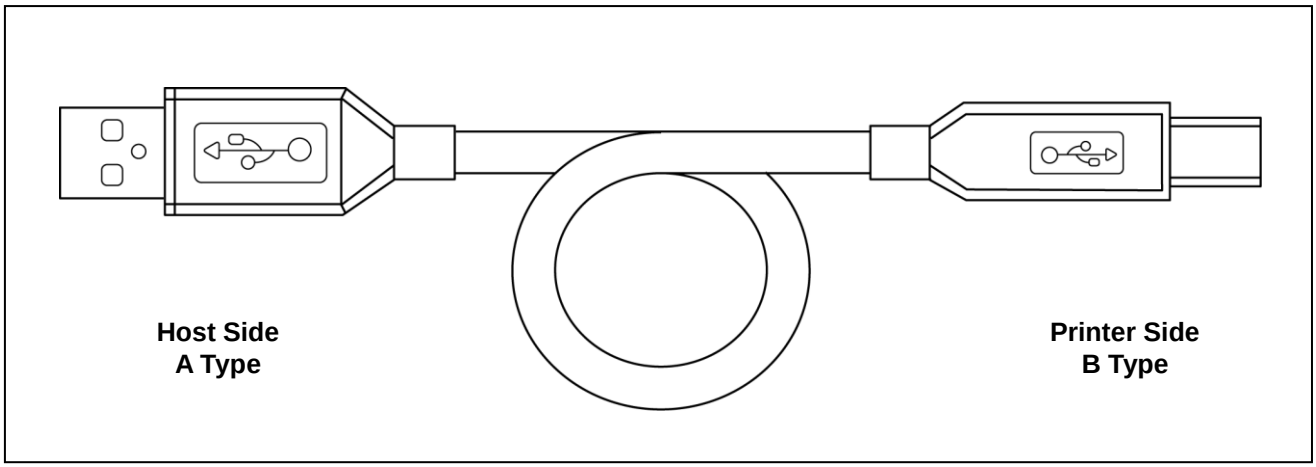
1) Specification

Item	Description	Remark
Transfer Type	BULK	
Data Signal	Bidirection, Half-Duplex Differential Signal Pair(D+ / D-)	
Data Format	NRZI Format Zero Bit Stuffing after 6 ones	
Transceiver	Differential Receive Sensitivity : 200 mV Differential Common Mode Range : 0.8 ~ 2.5 V Single-End Receiver Threshold : 0.8 ~ 2.0 V	
Speed	Hi-Speed, 480M bps	
Power	Self-Powered	
Cable & Connector	Cable : A to B Type Standard Connector : B Type	
Other	Supports the 480 Mbps high-speed(HS) mode for USB 2.0, as well as the 12 Mbps full-speed (FS) and the 1.5Mbps low-speed (LS) mode for USB 1.1	

2) Signal Description

Pin No	Signal Name	Assignment(Color)	Function
Shell	Shield	Drain Wire	Frame Ground
1	VBUS	Red	Host Power : DC5V/500mA
2	D-	White	Differential Data Line
3	D+	Green	Differential Data Line
4	GND	Black	Signal Ground

3) USB I/F Cable

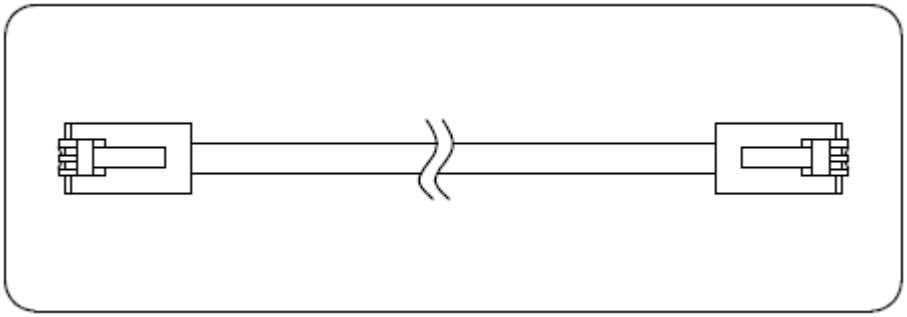


3-7-4 Ethernet I/F

1) Ethernet I/F specifications

Item	Description	Remark
Network Interface	10/100 Base-T All in one type (Auto detection)	
Protocol	TCP, UDP, IP, ICMP, ARP	
IP mode	Static IP, DHCP(Dynamic Host Configuration Protocol)	
Flow control	Hardware (RTS/CTS)	

2) Ethernet I/F cable



3) Ethernet I/F signal descriptions

Pin No.	Signal name	Assignment (Color)	Function
1	TD+	White Orange	Transmit +
2	TD-	Orange	Transmit -
3	TCT	White Green	Receive +
4	NC	Blue	
5	NC	White Blue	
6	RCT	Green	Receive -
7	RD+	White Brown	
8	RD-	Brown	

* For more information, refer to the Ethernet User Manual in Bixolon Web Site.

3-7-5 WLAN

1) WLAN specifications
Support IEEE 802.11b/g Infrastructure, Ad-hoc mode.

[Frequency Band and Operating Channels]

Item	Description
Frequency band	2.4000 – 2.497 GHz
Modulation	OFDM with BPSK, QPSK, 16QAM, 64QAM (11g) BPSK, QPSK, CCK (11b)
Data rate	54/48/36/24/18/12/11/9/6/5.5/2/1 Mbps auto fallback
Protocol	TCP, UDP, IP, ICMP, ARP

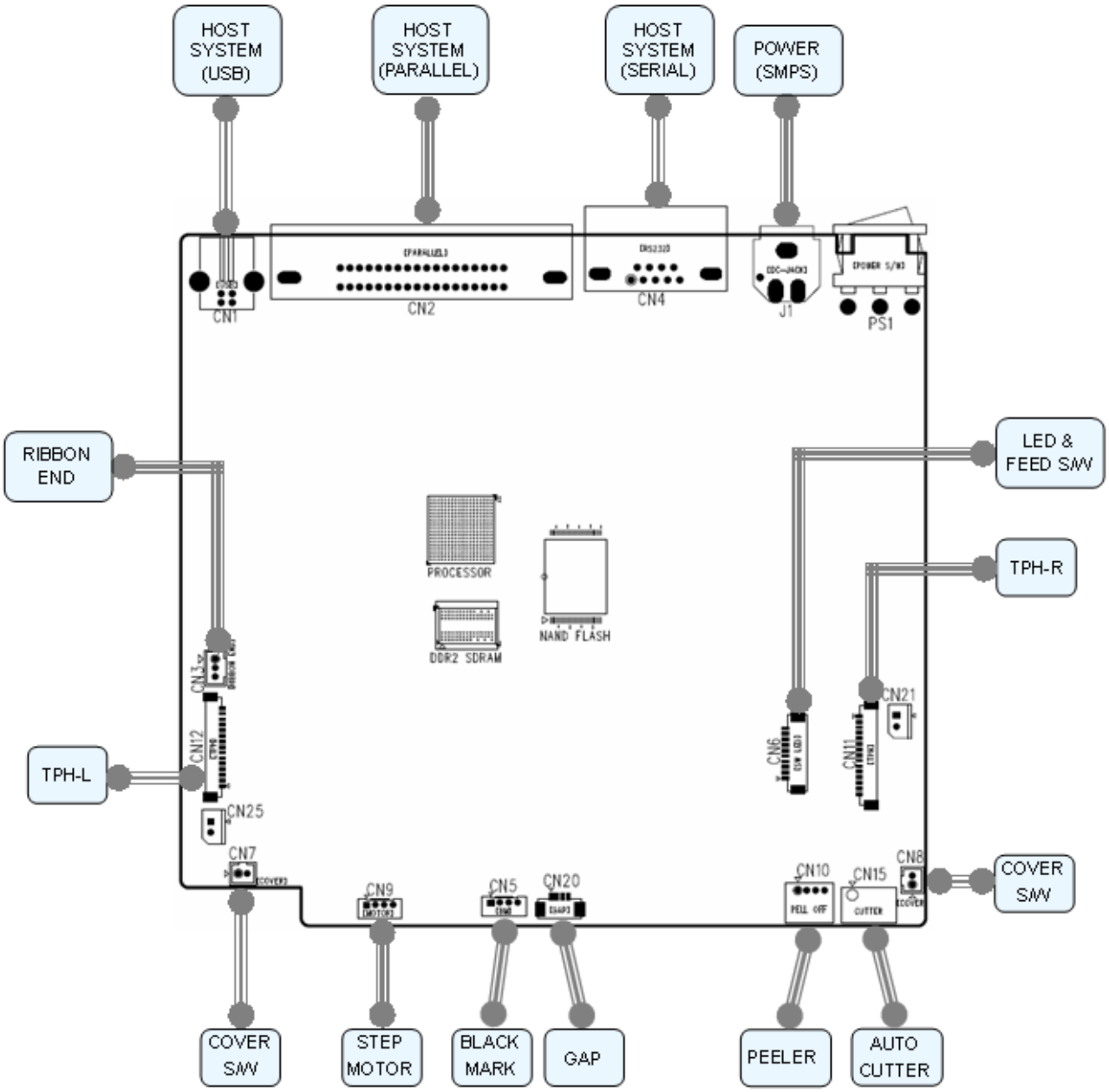
[Security]
- WEP64/128
- WPA/WPA2(TKIP/AES-CCMP) PSK
- HTTPS(SSL2.0, SSL3.0, TLS1.0)

2) WLAN USB Adapter
BIXOLON printers require WLAN USB adapter to use the wireless LAN function.
WLAN USB Adapter for BIXOLON printers should be available from BIXOLON.
USB Adapter from market not BIXOLON is not guaranteed to be working properly with BIXOLON printers.

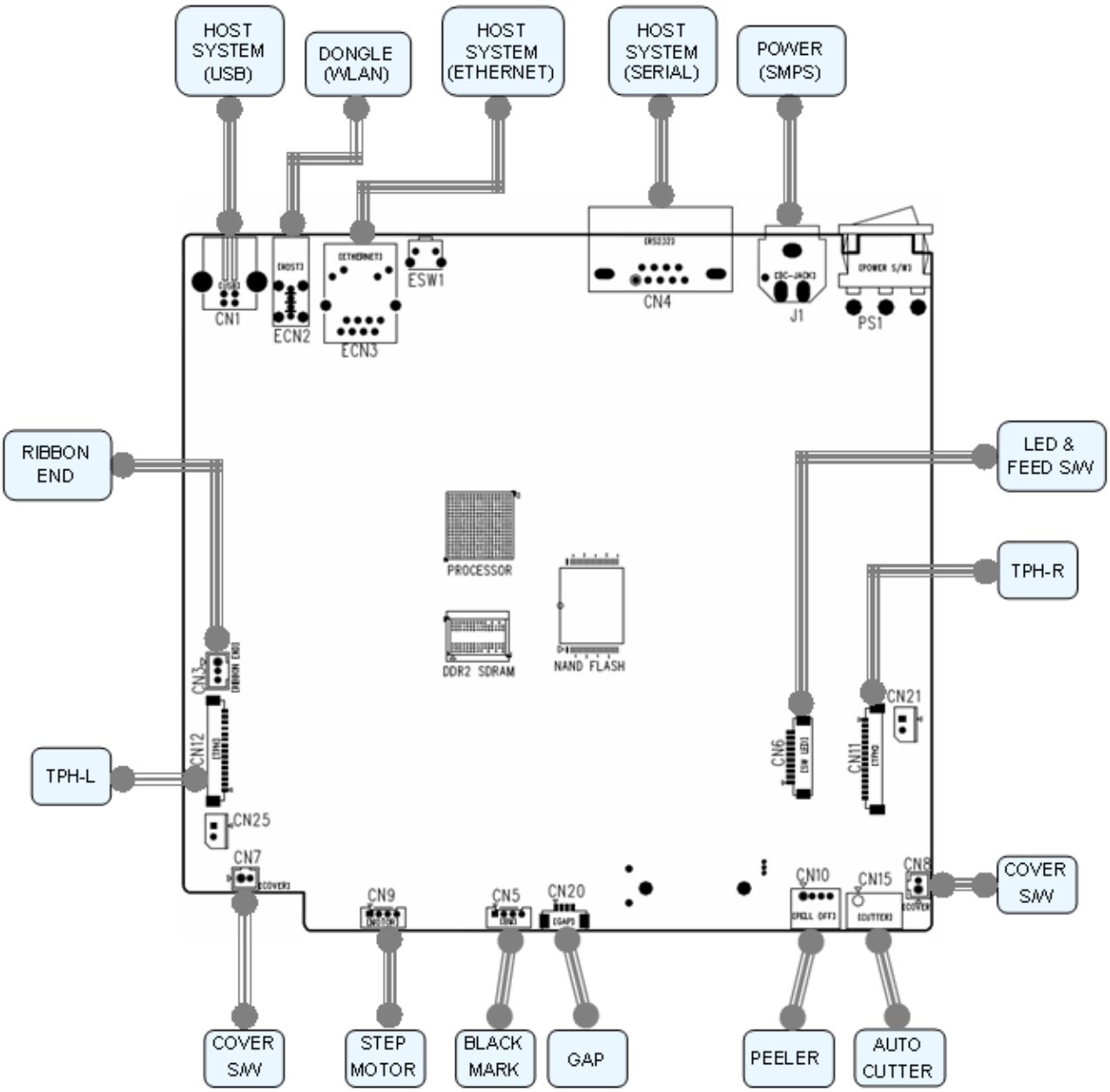
4. Hardware

4-1 Wiring Diagram

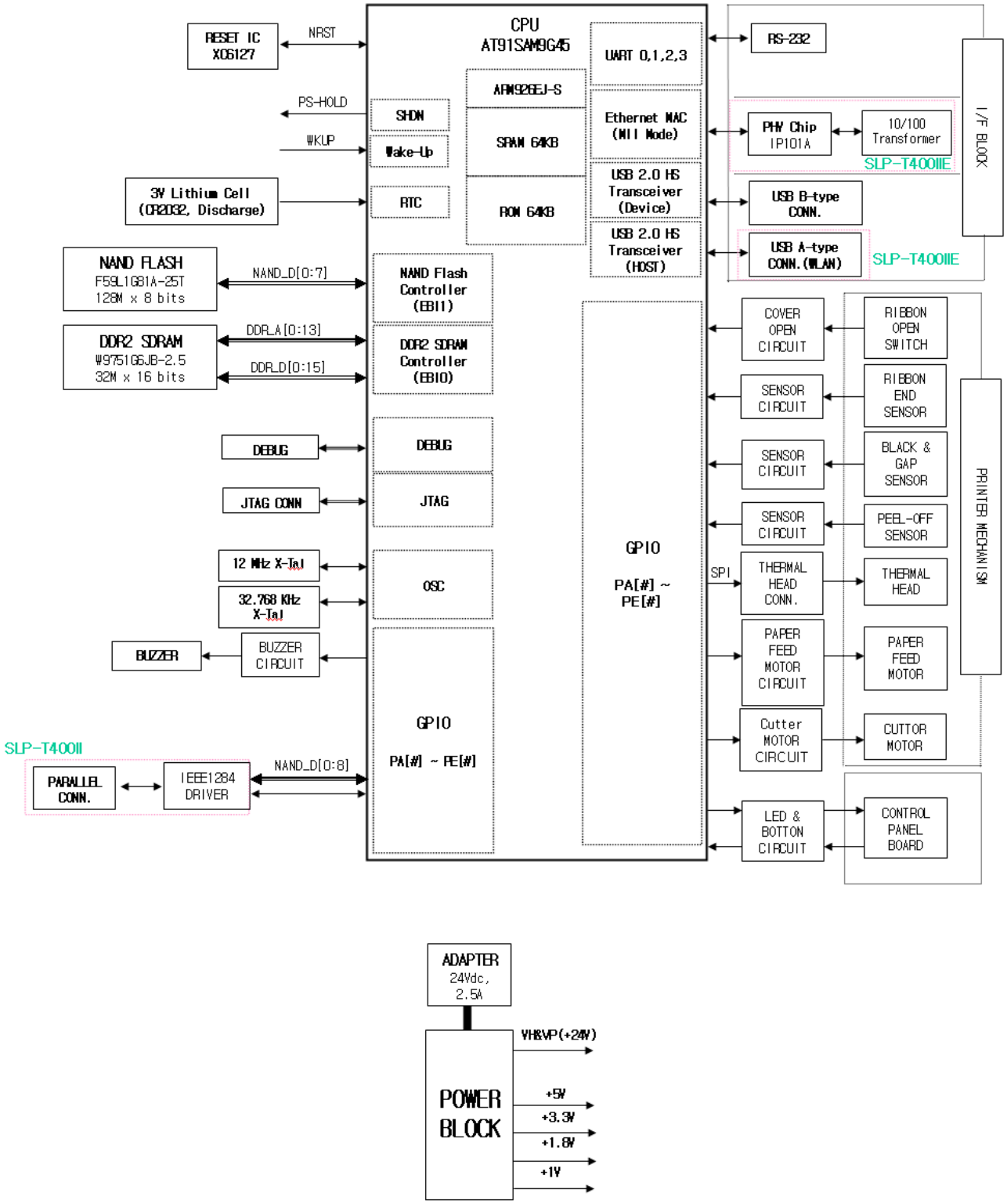
4-1-1 SLP-TX40x Board Wiring Diagram



4-1-2 SLP-TX40xE Board Wiring Diagram



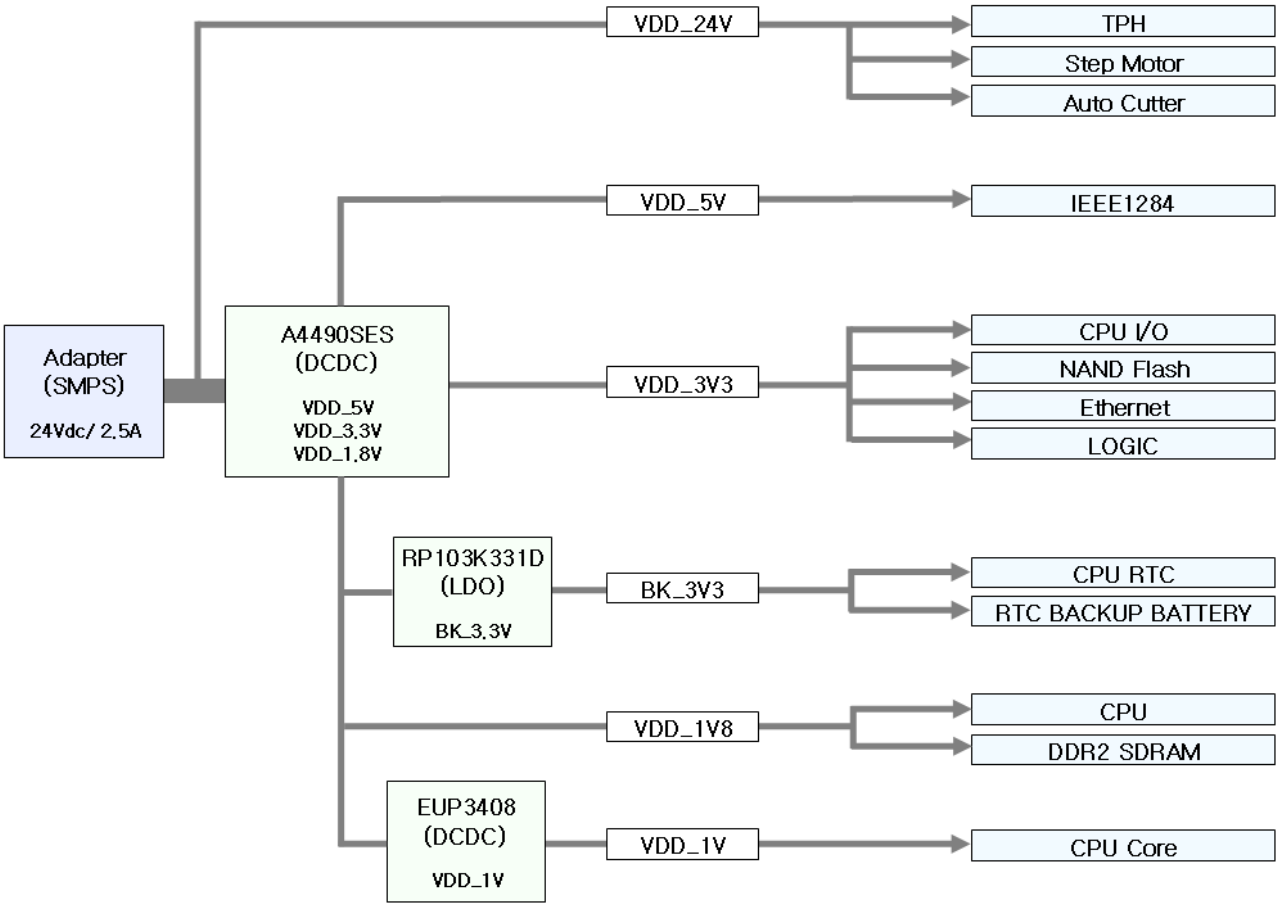
4-2 Block Diagram



4-3 Special Circuit Description

4-3-1 Power Circuit

This system is operated under 100Vac or 240Vac. The power circuit supplies the three differential DC voltage sources.



No.	VOLTAGE	DESCRIPTION
1	VDD_24V (+24VDC)	Step Motor & Auto Cutter Voltage
2	TPH_24V (+24VDC)	Thermal Printer Head (TPH) Voltage
3	VDD_5V (+5VDC)	IEEE1284 Logic IC Voltage
4	VDD_3V3 (+3.3VDC)	CPU I/O, NAND Flash, Ethernet, LOGIC Etc. Voltage
5	BK_3V3 (+3.3VDC)	RTC, Backup Battery Voltage
6	VDD_1V8 (+1.8VDC)	CPU, DDR2 SDRAM Voltage
7	VDD_1V (+1VDC)	CPU Core Voltage

1) Feed, Auto Cutter Motor Voltage, TPH Driving Voltage : +24VDC
   +24VDC is supplied from SMPS.
   This voltage is used as a Step motor driving voltage and a source voltage of the other voltage sources and TPH Driving Voltage.

2) IEEE1284 Logic IC Voltage : +5VDC
   Change the input +24VDC to +5VDC by a regulation. U7(A4490EESTR)

3) CPU I/O, NAND FLASH, Ethernet and Etc. Voltage : +3.3VDC
Change the input +24VDC to +3.3VDC by a regulation. U7(A4490EESTR)

4) RTC Voltage : +3.3VDC
Change the input +5VDC to 3.3VDC by a regulation. U8(RP103K331D)

5) DDR2 SDRAM Voltage : +1.8VDC
Change the input +24VDC to +1.8VDC by a regulation. U7(A4490EESTR)

6) CPU Core Voltage : +1VDC
Change the input +5VDC to +1VDC by a regulation. U13(EUP3408)

4-3-2 Reset Circuit

Reset signal is a signal in order to start-up CPU under Power-On.
Reset circuit uses a reset IC(XC6127N27C, U24). When +3.3Vdc is fallen under +2.7Vdc by Power-Off, reset signal prohibits the system from misoperating by lowering down to 0V.

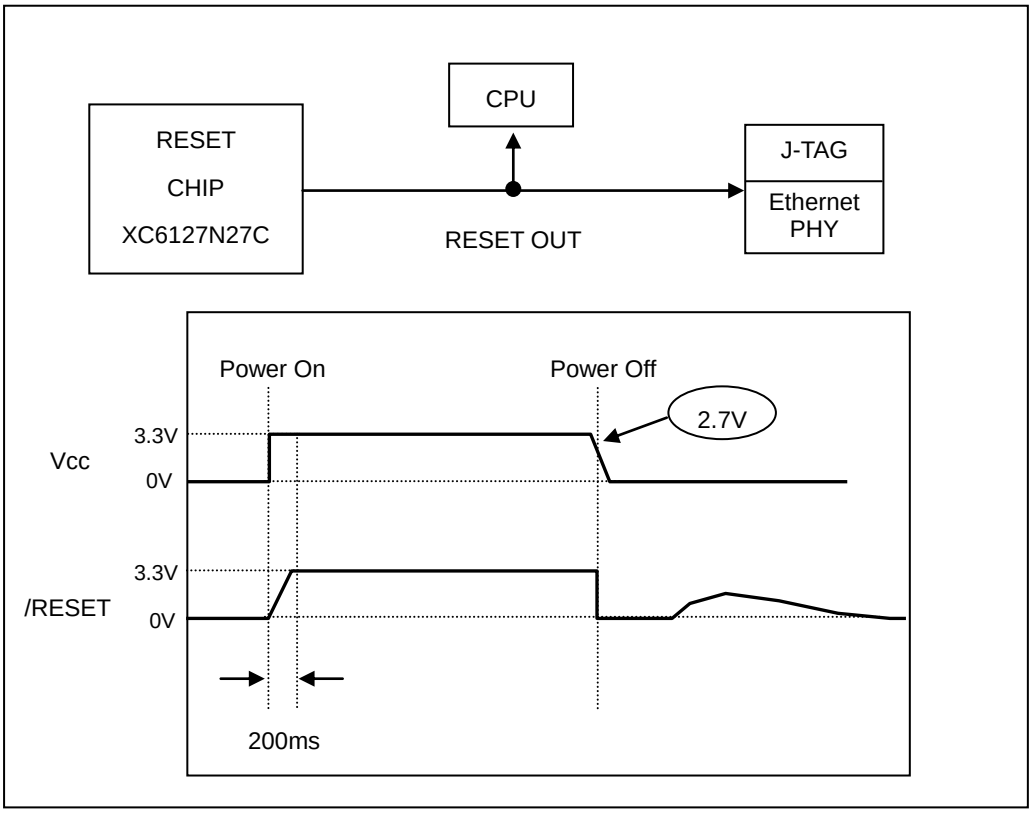


Figure 4-1 Reset Circuit

4-3-3 RS232C Communication Block Diagram

The CPU and RS-232C driver(ST3232) are used for serial communication.

1) RS232C Communication block diagram

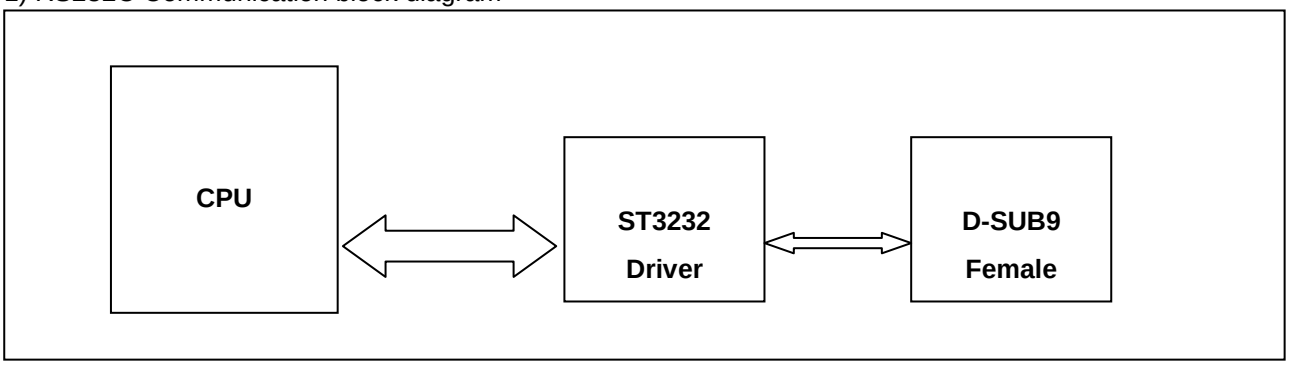


Figure 4-2 RS232C Communication Block

2) RS232C Communication waveform

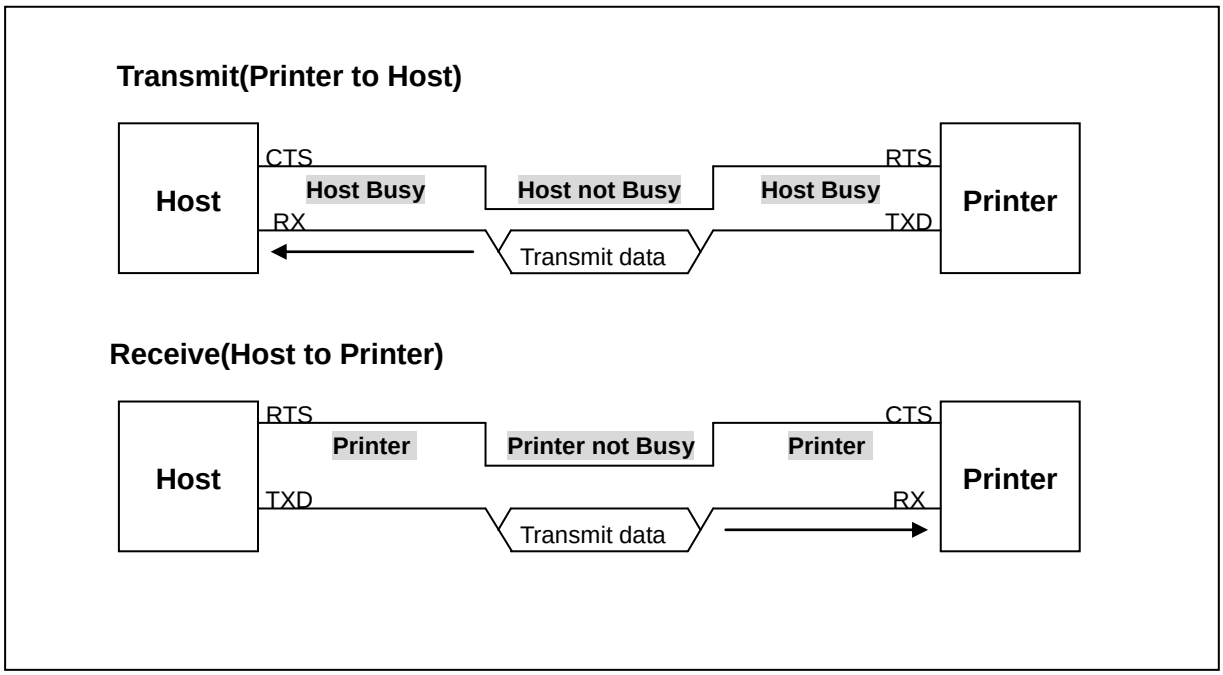


Figure 4-3 RS232C Communication Waveform

4-3-4 Parallel Communication Block Diagram

The printer support the bi-directional parallel interface with centronics, Nibble, Byte mode.
The centronics is Forward mode and the nibble, byte mode are reverse mode.

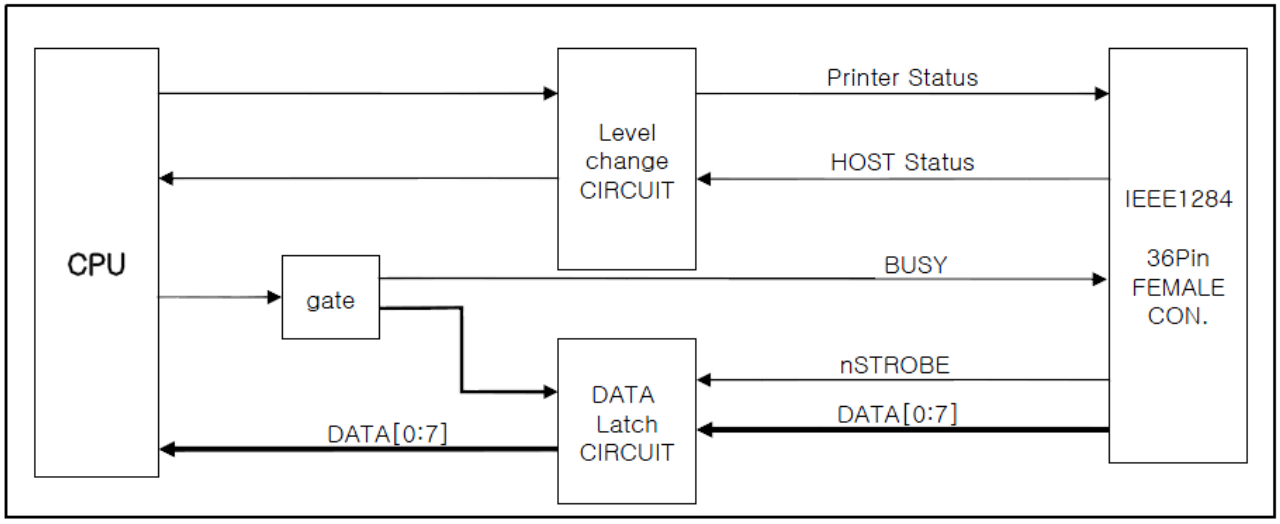


Figure 4-4 IEEE1284 Communication Block Diagram

4-3-5 USB Communication Block Diagram

The printer support the USB(Universal Serial Bus). The transfer type is the BULK

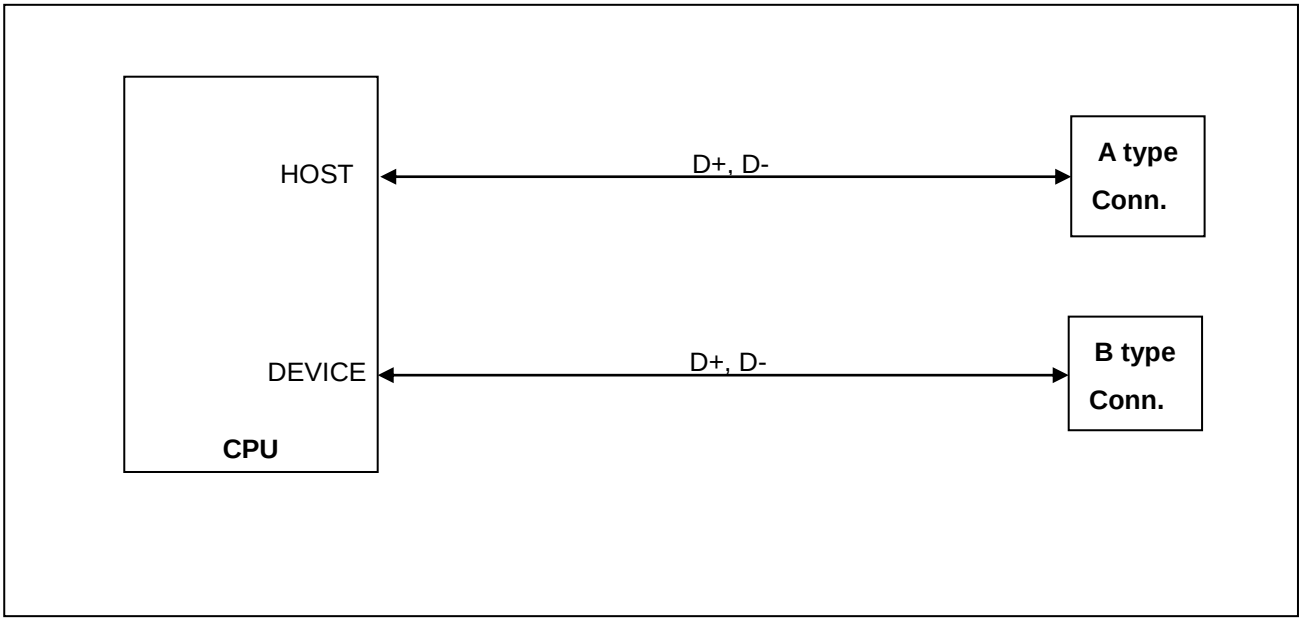


Figure 4-5 USB 2.0 Communication Block Diagram

4-3-6 Ethernet Communication Block Diagram

The printer support the Ethernet. The Network type is 10/100 Base-T All in one type. (Auto detection)

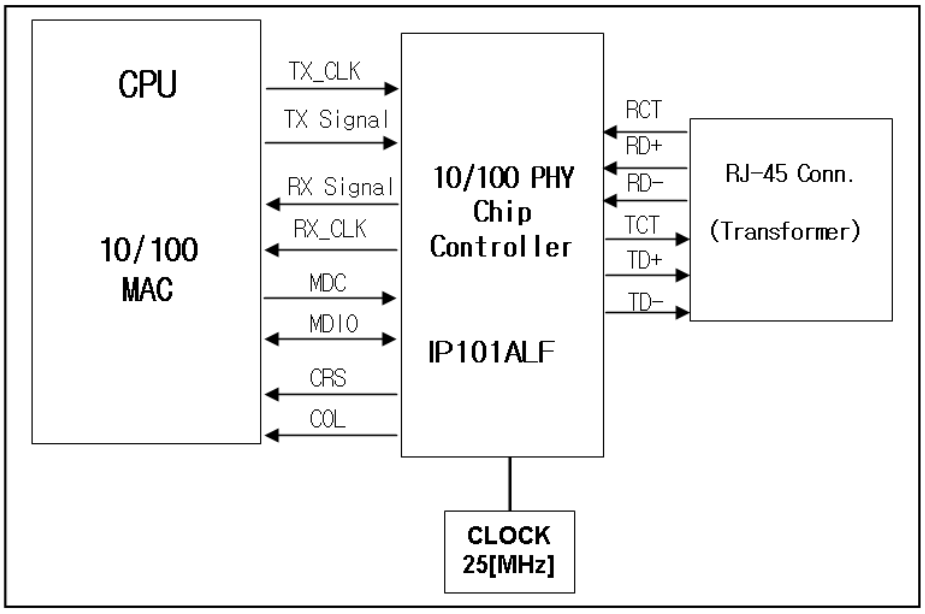


Figure 4-6 Ethernet Communication Block Diagram

4-3-7 Thermal Pinter Circuit

First, the CPU sends a serial clock and serial data 832bits(104bytes) to the shift register of the TPH. Second, the CPU send a Latch signal to the TPH. Then the Data of both shift register#1 and #2 are moved to the Latch register. After that the CPU sends a strobe signal to the TPH. Then the TPH outputs the serial data. Each strobe signal controls the each dot of TPH.

Table 4-1 Printer Head Strobe Processing

Strobe No.(TPH)	Dot No.	Dots/STB	Strobe pin(CPU)
STB1	1 ~ 144	144	TPH_STB1
STB1	145 ~ 288	144	TPH_STB1
STB1	289 ~ 432	144	TPH_STB1
STB2	433 ~ 576	144	TPH_STB2
STB2	577 ~ 720	144	TPH_STB2
STB2	721 ~ 864	144	TPH_STB2

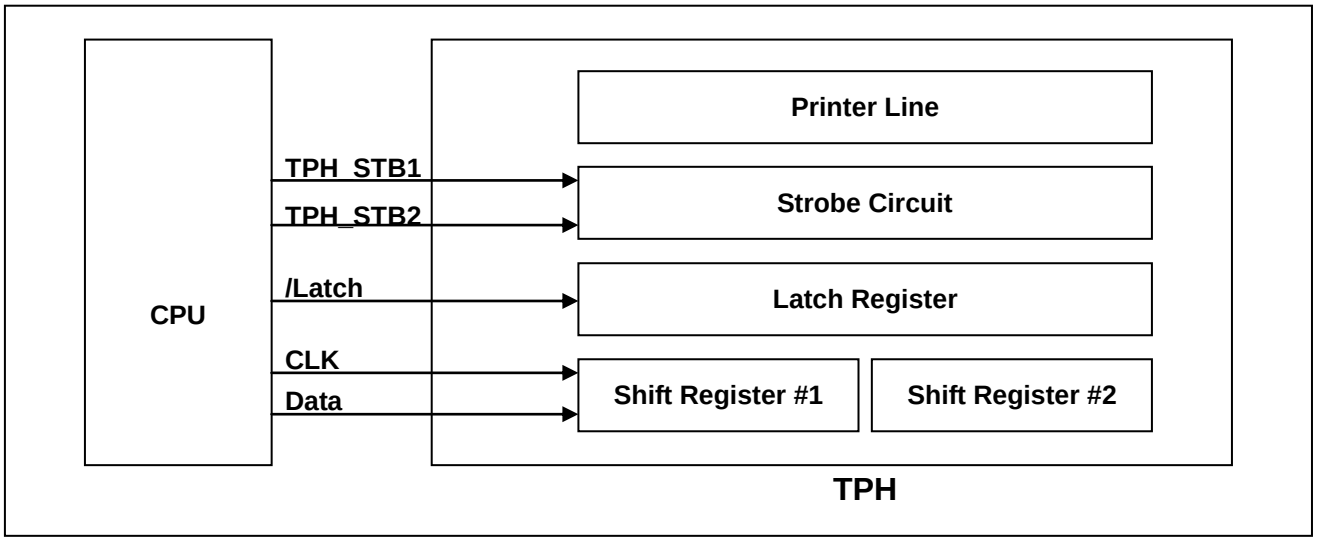


Figure 4-7 Thermal Printer Block Diagram

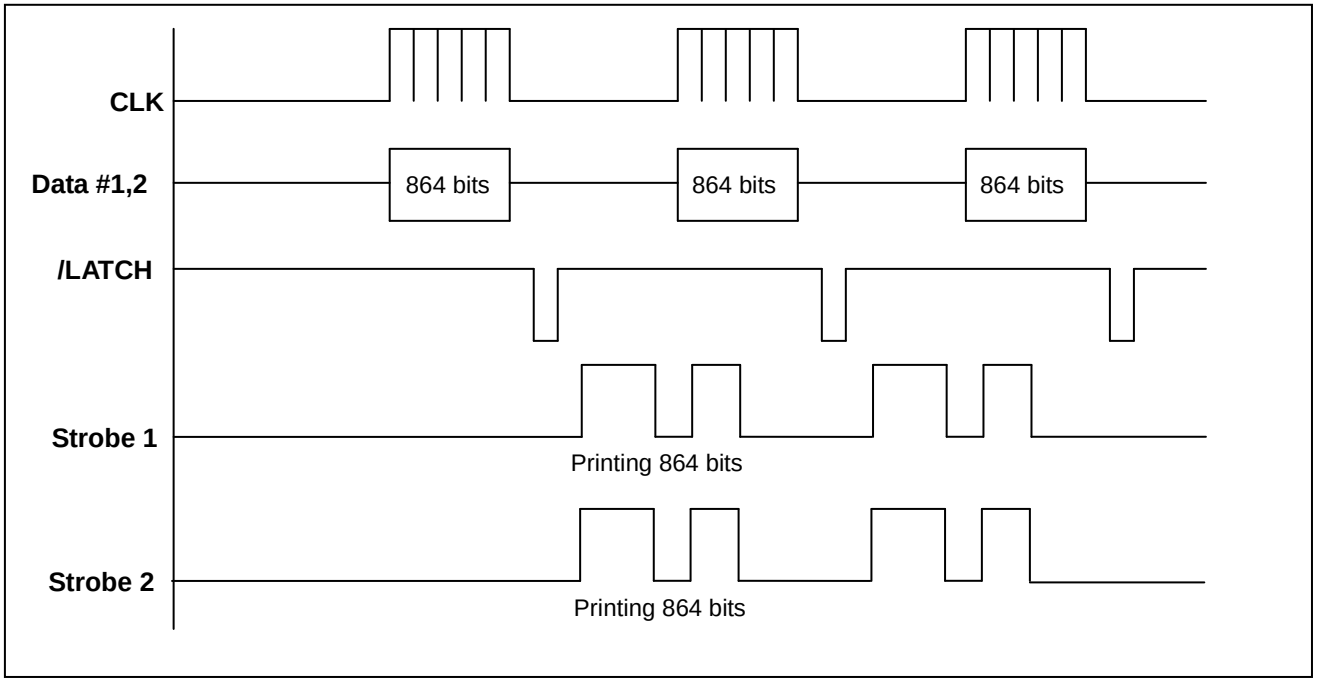


Figure 4-8 Thermal Printer Timing Waveform

5. Disassembly and Assembly

5-1 Case Lower Block

5-1-1 Case Lower Block

1) Remove the four screws①.
2) Separate the Cover Dip②, the Case-Lower④ and the Foot-Rubber③ from the printer.

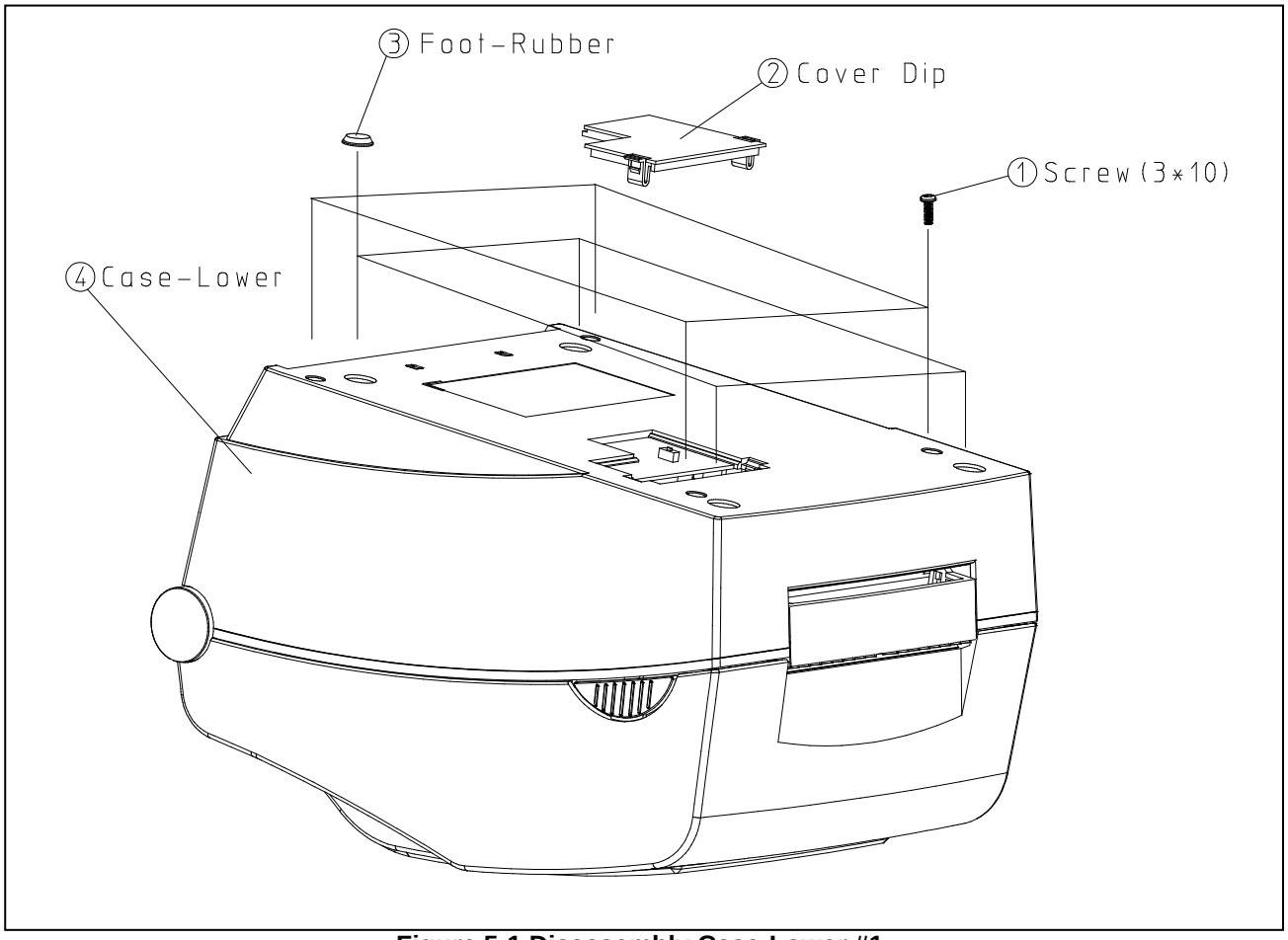


Figure 5-1 Disassembly Case-Lower #1

5-1-2 Main PBA Block

1) Remove the four screws ①.
2) Remove the connector wires ③~⑨ from Main PBA and sub Assembly.
3) Separate the Main PCB ② and sheet PCB ⑩ from the Printer.

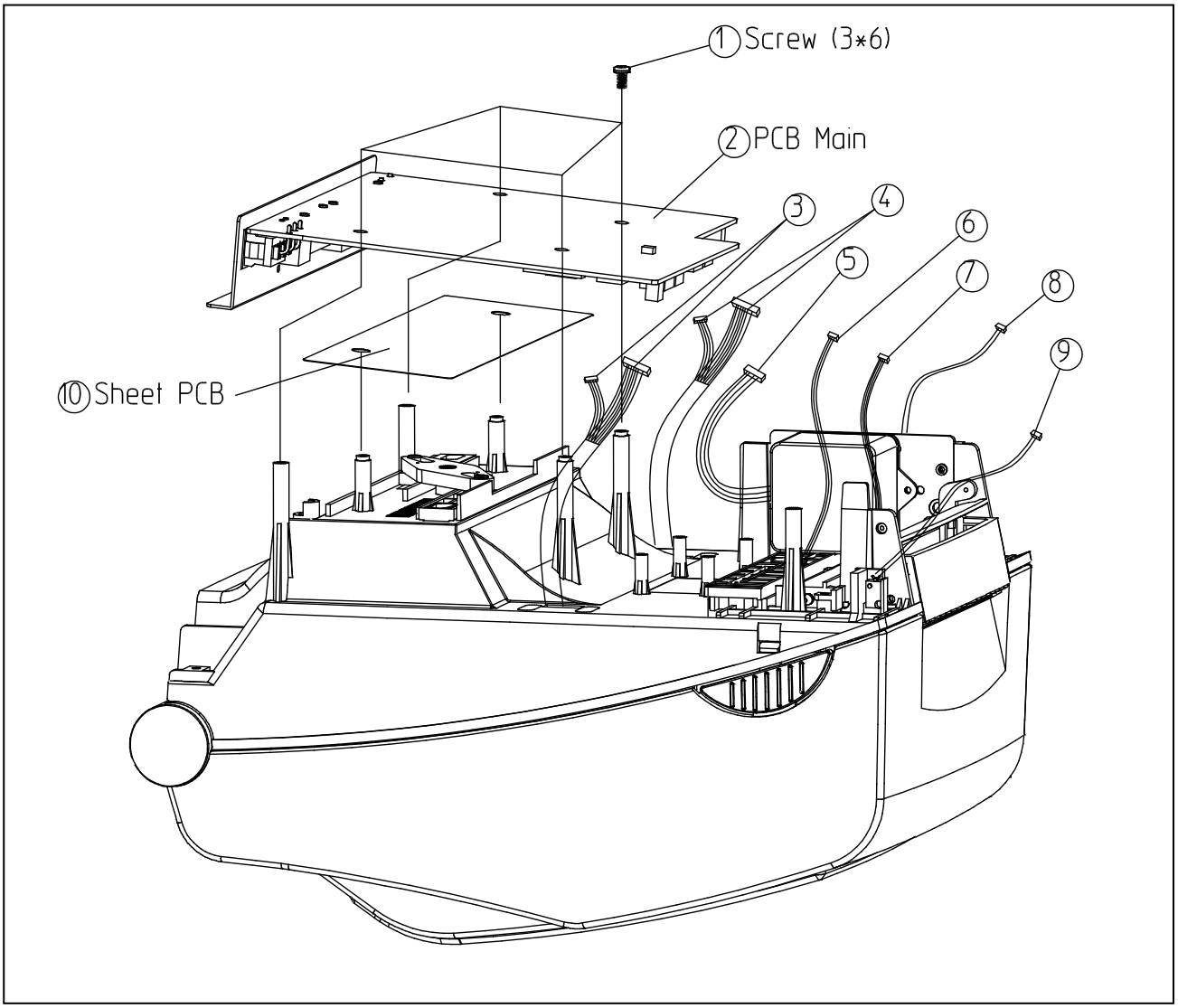


Figure 5-2 Disassembly Case-Lower #2

5-2 Case Upper Block

5-2-1 Case Upper Block

1) Remove the one screw② and Separate the Hinge upper-B③.
2) Separate the Case upper Assembly① from the Printer.
3) Remove the four screws②
4) Separate the Cover top⑤, the Hinge upper-A④ and Label Function⑥ from the Case upper Assembly①

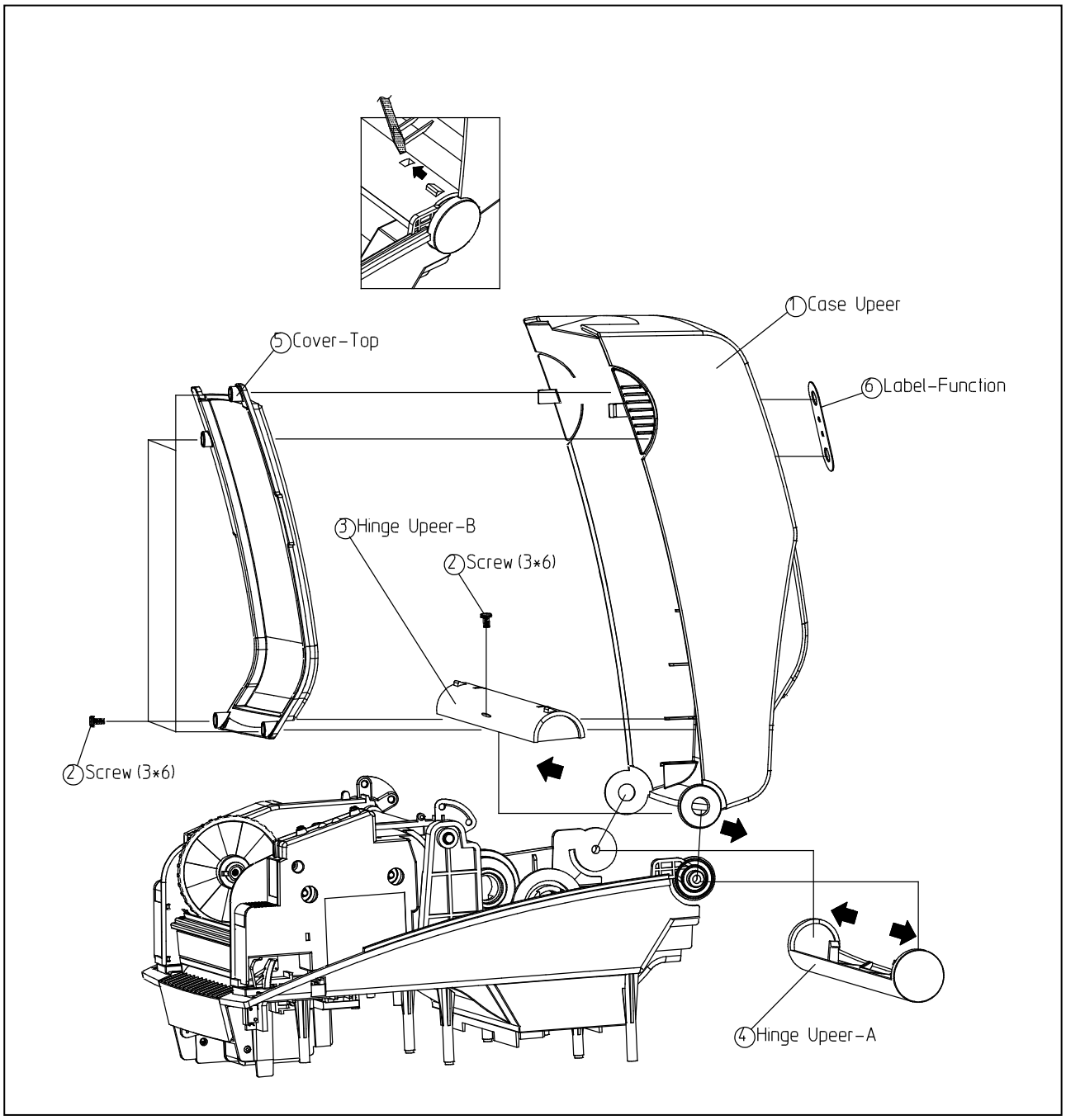


Figure 5-3 Disassembly Case Upper #1

5-3 Frame Ribbon Block

5-3-1 Frame Ribbon Block

1) Remove the Eight Screws①
2) Separate the Frame Ribbon Assembly③ from the Frame Lower Assembly②.

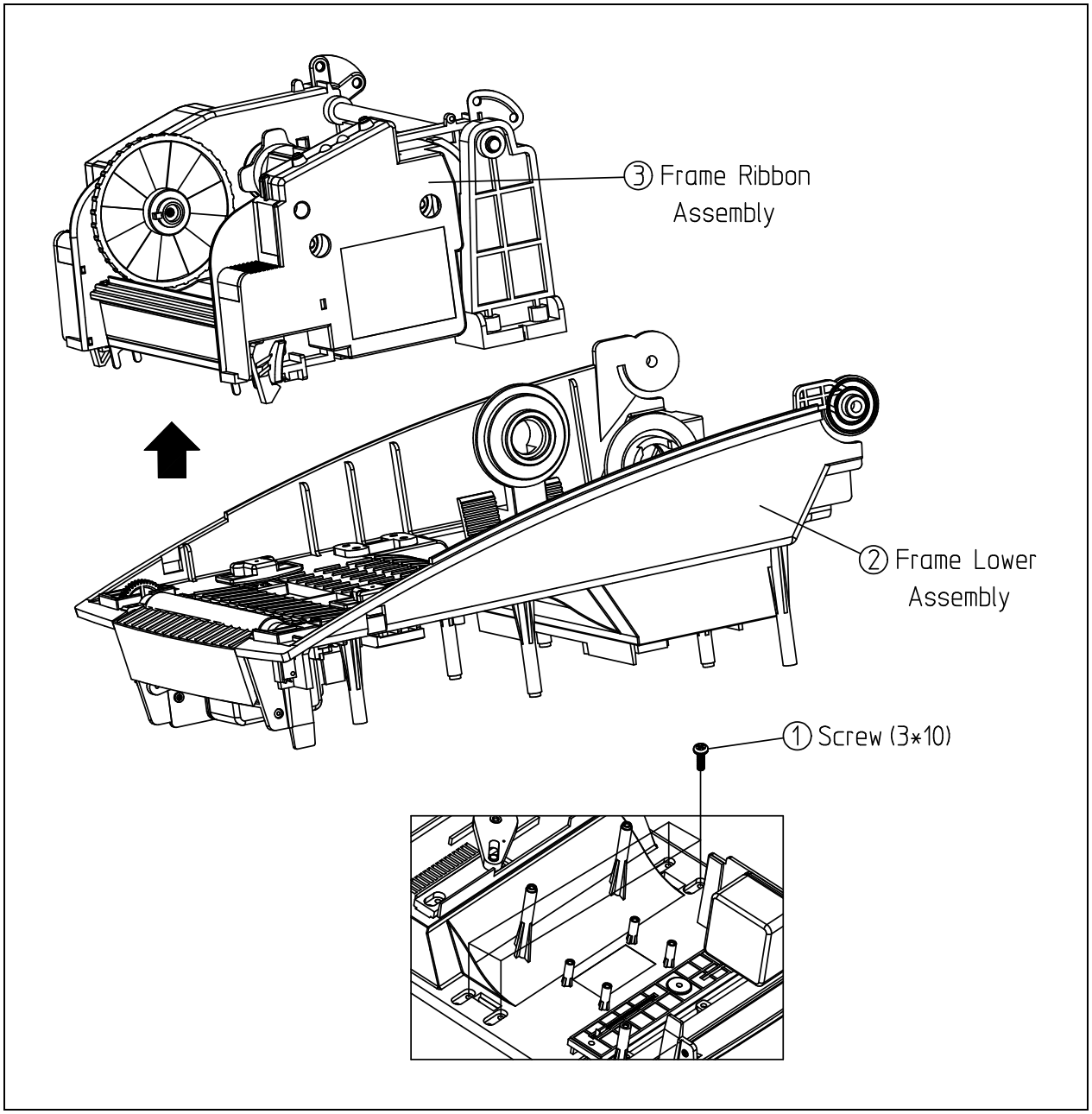


Figure 5-4 Disassembly Frame Ribbon #1

5-3-2 Frame Ribbon Assembly Block

1) Remove the E-Ring①.
2) Separate the Hinge ②~⑥ from the Frame Ribbon Assembly.
3) Remove the two Screws⑧.
4) Separate the Cover-L⑨ and the Cover-R⑩ from the Frame Ribbon Assembly.

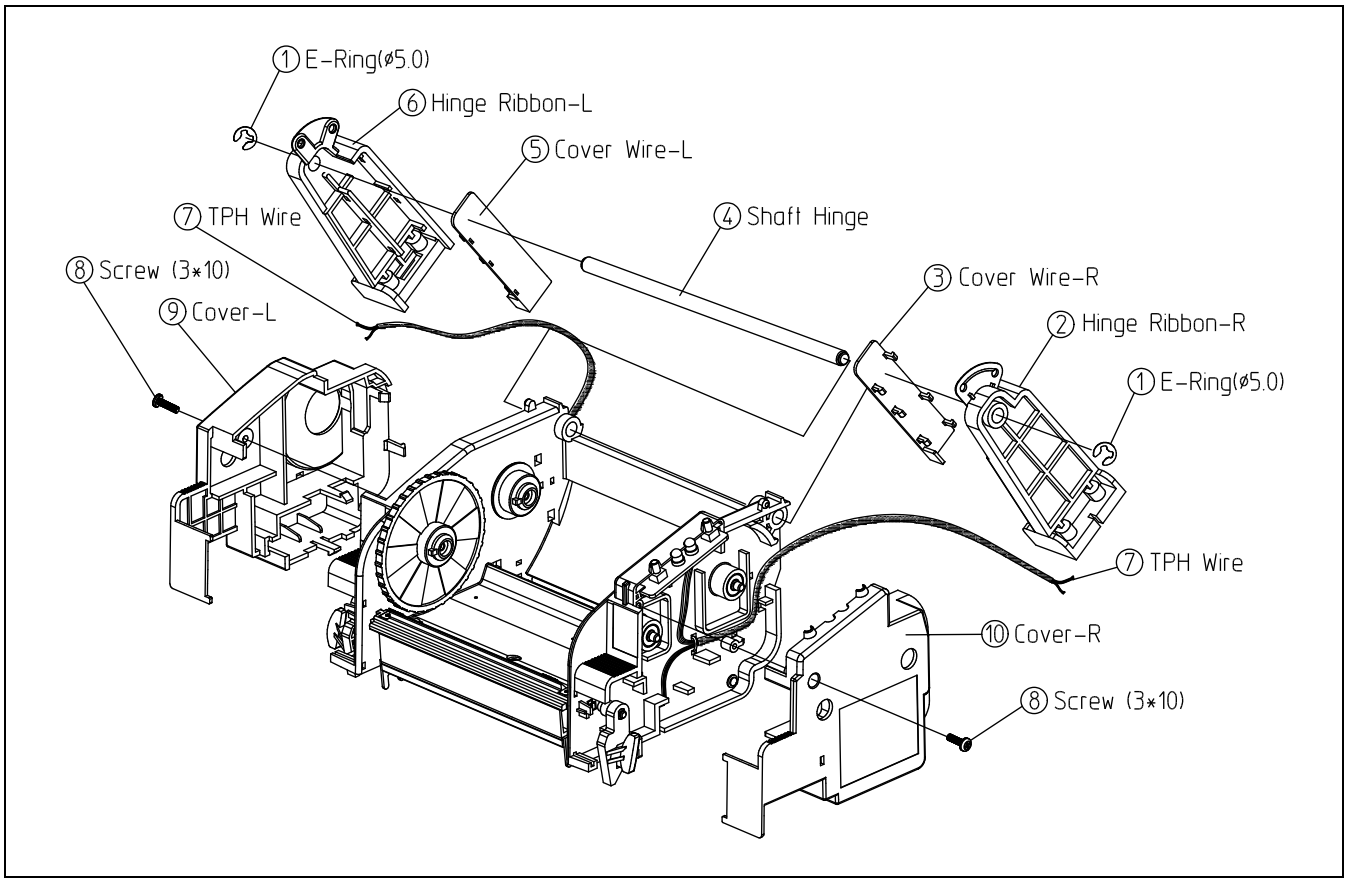


Figure 5-5 Disassembly Frame Ribbon #2

5-3-3 TPH Assembly Block

1) Remove the Screw③ and Separate the R-End PBA④ from the Frame Ribbon Assembly.
2) Separate the TPH Assembly② from the TPH wire.
   * Disassembly TPH Assembly
   (1) Remove the two Screws⑥ and three Screws⑦.
   (2) Separate the Parts⑧~⑭.

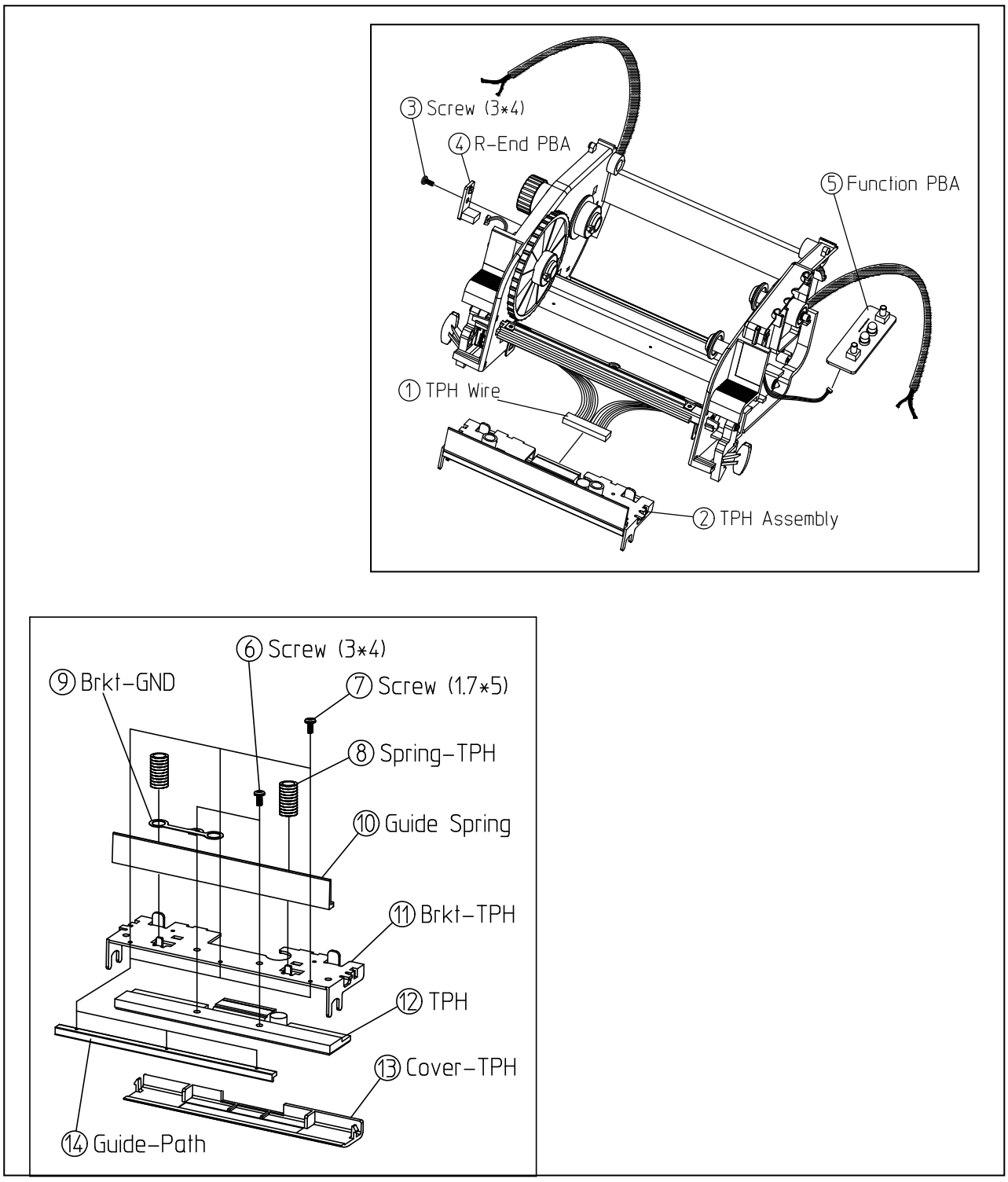


Figure 5-6 Disassembly Frame Ribbon #3

5-3-4 Door Lock Assembly Block

1) Remove the two E-Rings①.
2) Separate the Door Lock-R②, the Shaft Lock③ and the Door Lock-L④ from the Frame Ribbon Assembly⑤.

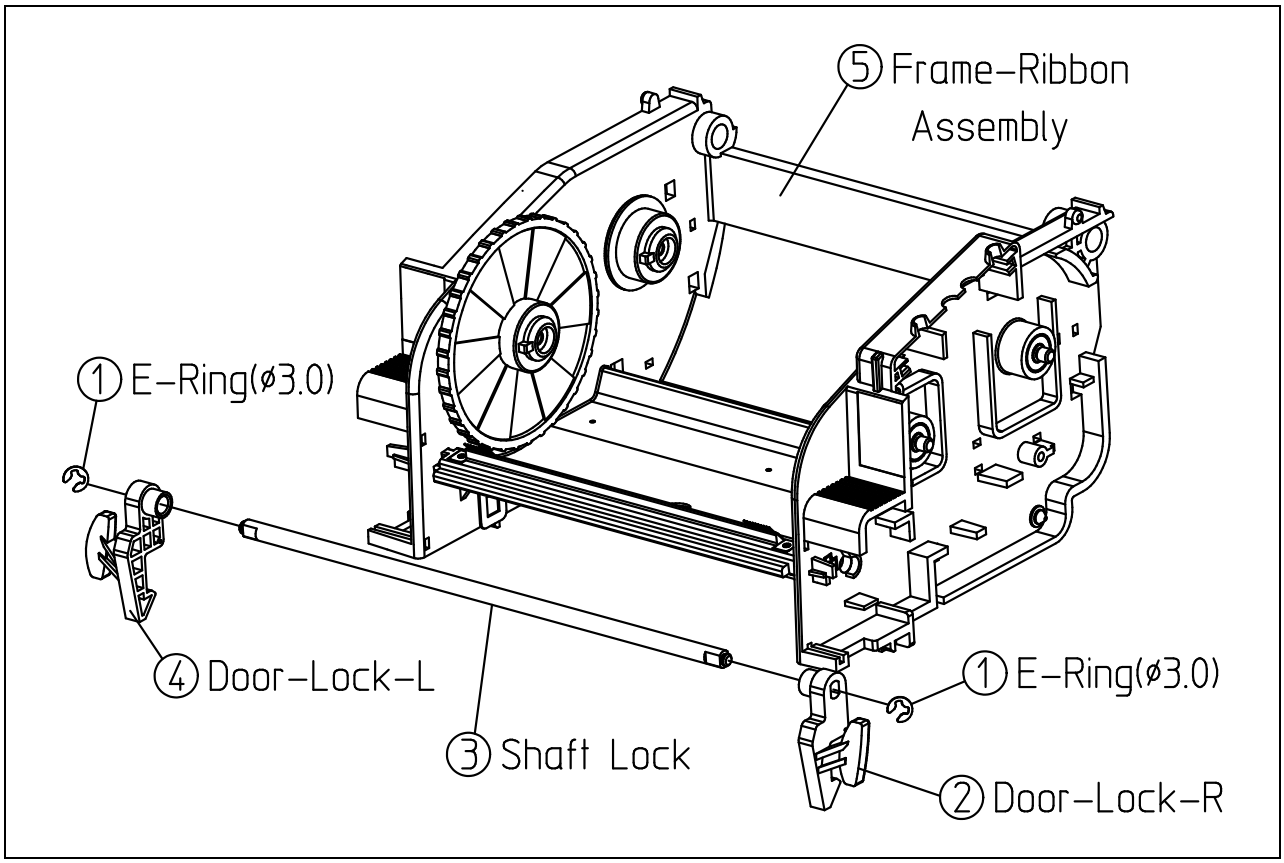


Figure 5-7 Disassembly Frame Ribbon #4

5-3-5 Clutch Assembly Block

1) Remove the E-Rings①.
2) Separate the Parts②~⑮.
3) Remove the Screws⑧.

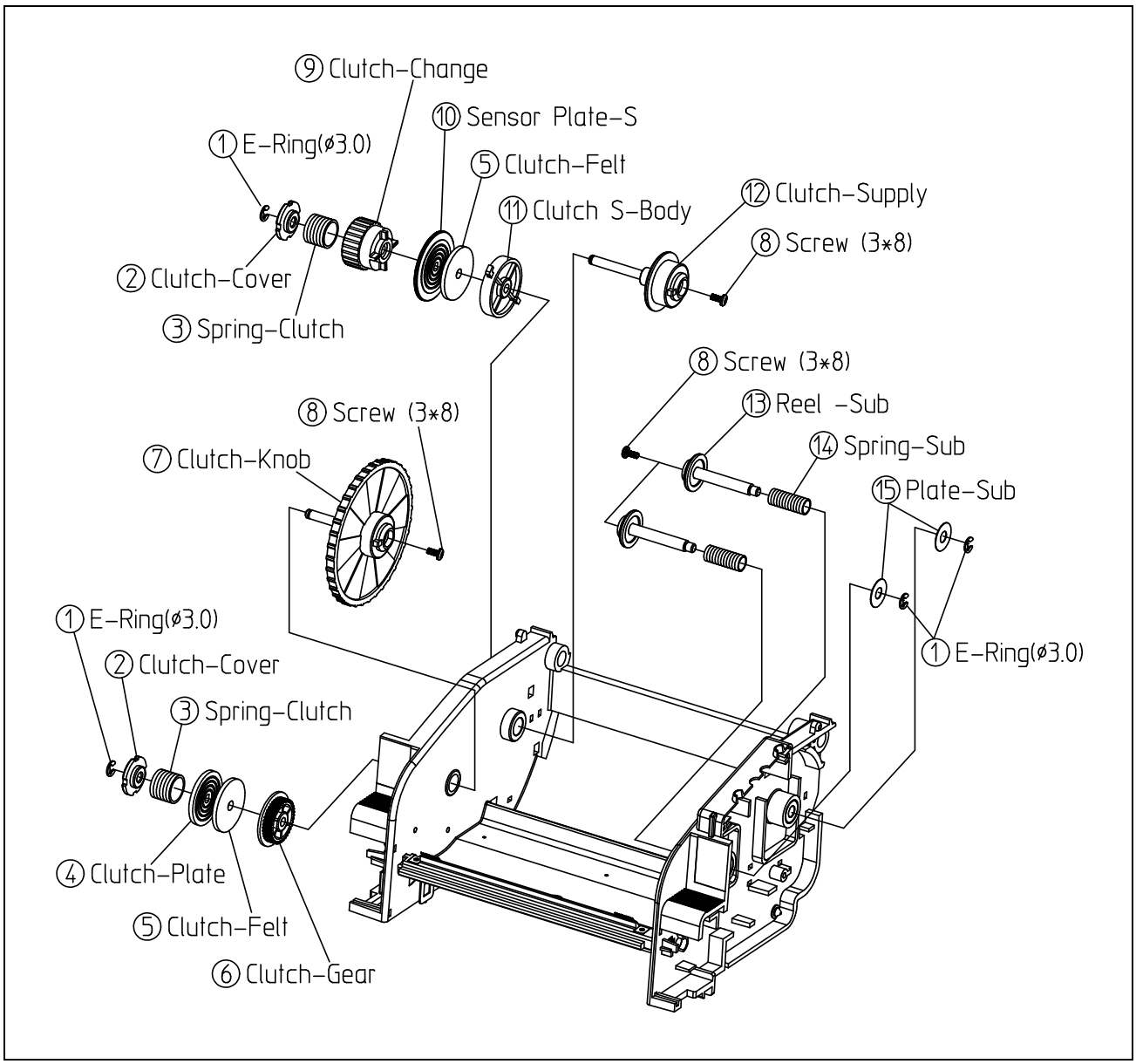


Figure 5-8 Disassembly Frame Ribbon #5

5-3-6 Etc Assembly Block

1) Remove the three Screws①.
2) Separate the Gear Assembly②~⑤ from the Frame Ribbon.
3) Remove the Washer⑥.
4) Separate the Shaft Roller⑦ and the Roller Paper⑧ from the Frame Ribbon.
5) Remove the Screw⑨ and separate the Brkt Assembly⑩~⑬.
6) Remove the two Screws① and separate the Hook-TPH⑭
7) Remove the three Screws⑮⑰and separate the Cover Wire.

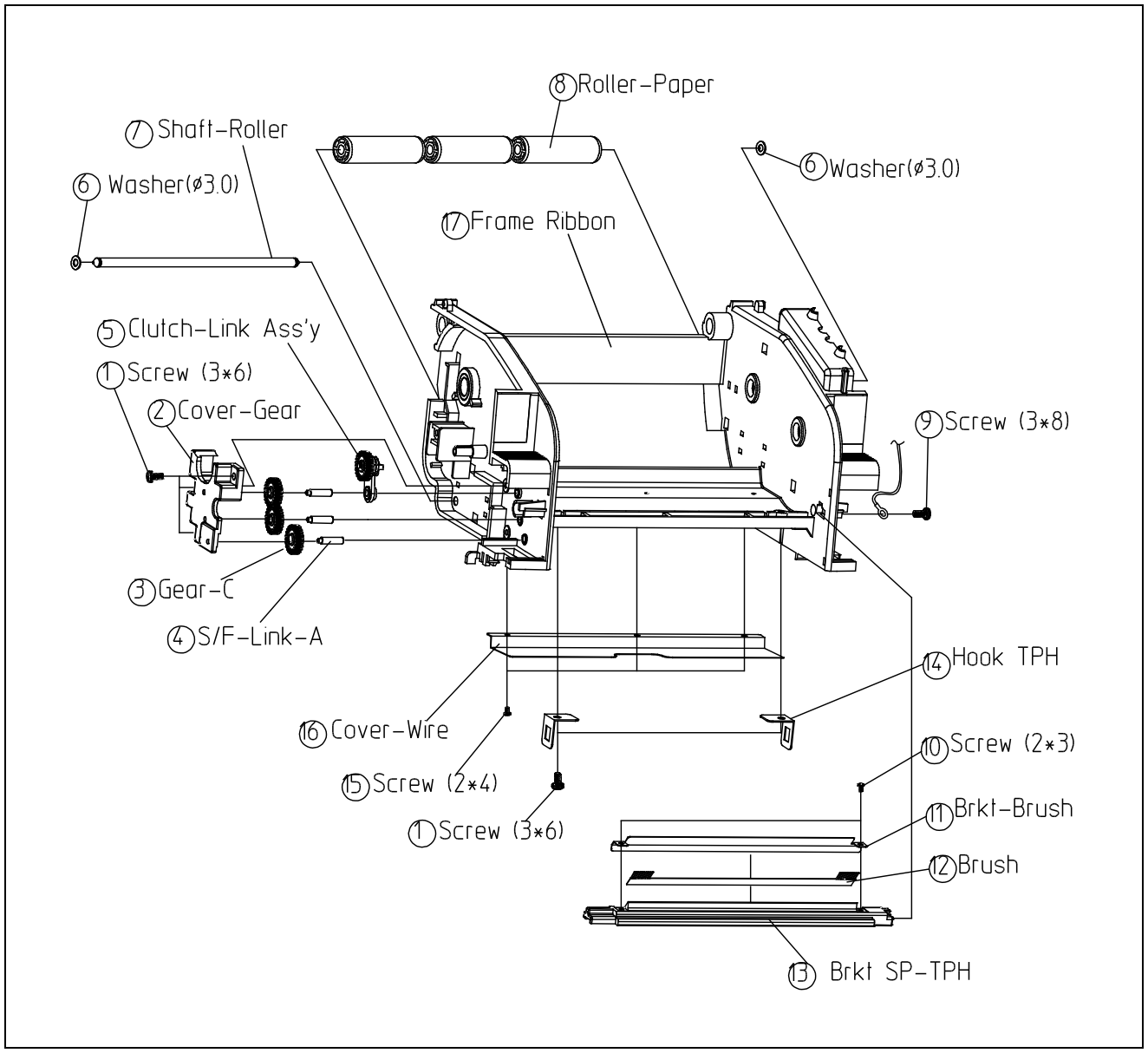


Figure 5-9 Disassembly Frame Ribbon #6

5-4 Frame Lower Block

5-4-1 Holder Paper Block

1) Remove the five Screws②⑤.
2) Separate the Link③, the Spring Link④ and the Link LR⑥ from the Frame Lower①.
3) Separate the Holder Paper-L⑦ / R⑧ from the Frame Lower①.
4) Separate the Holder Paper Fixed⑨ from the Holder Paper-R⑧.

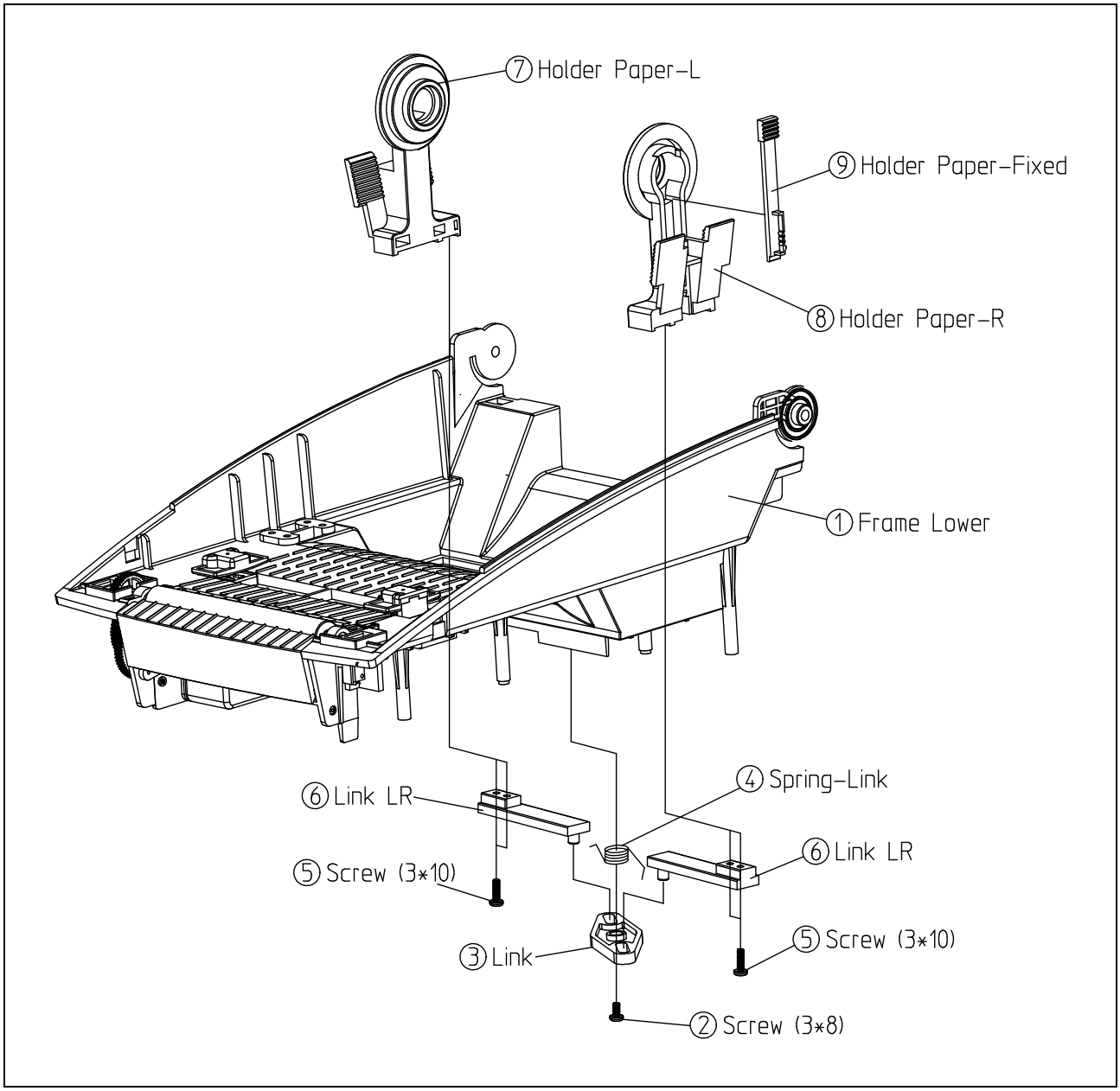


Figure 5-10 Disassembly Frame Lower #1

5-4-2 Guide Paper and Roller Assembly Block

1) Remove the four Screws② and separate the Guide Paper-up⑥.
2) Remove the two Screws② and separate the Guide Paper-down④.
3) Remove the four Screws⑦ and separate the Roller Assembly⑧~⑪ from the Frame Lower①.
4) Separate the Cover STD⑫ from the Frame Lower①.

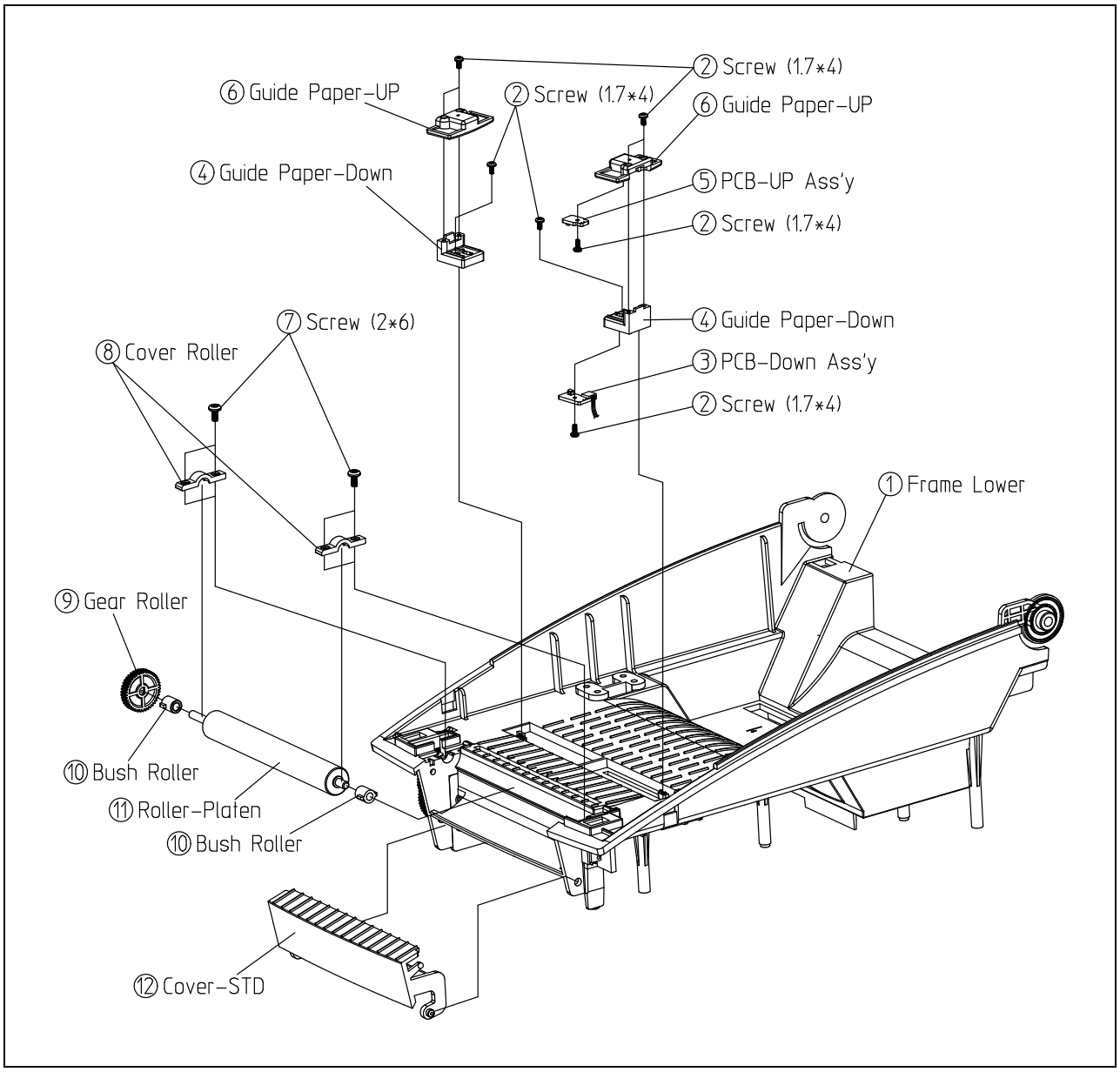


Figure 5-11 Disassembly Frame Lower #2

5-4-3 Motor Assembly Block

1) Remove the two Screws③.
2) Separate the two Switch Assembly② from the Frame Lower①.
3) Remove the two Washers④ and separate the Gear B200⑤.
4) Remove the two Screws⑥⑦ and separate the Motor Assembly from the Frame Lower①.
5) Separate the Gear ALS200 II⑨ from the Brkt Motor⑧.
6) Remove the three Screws⑥ and separate the Motor⑩ from the Brkt Motor⑧.

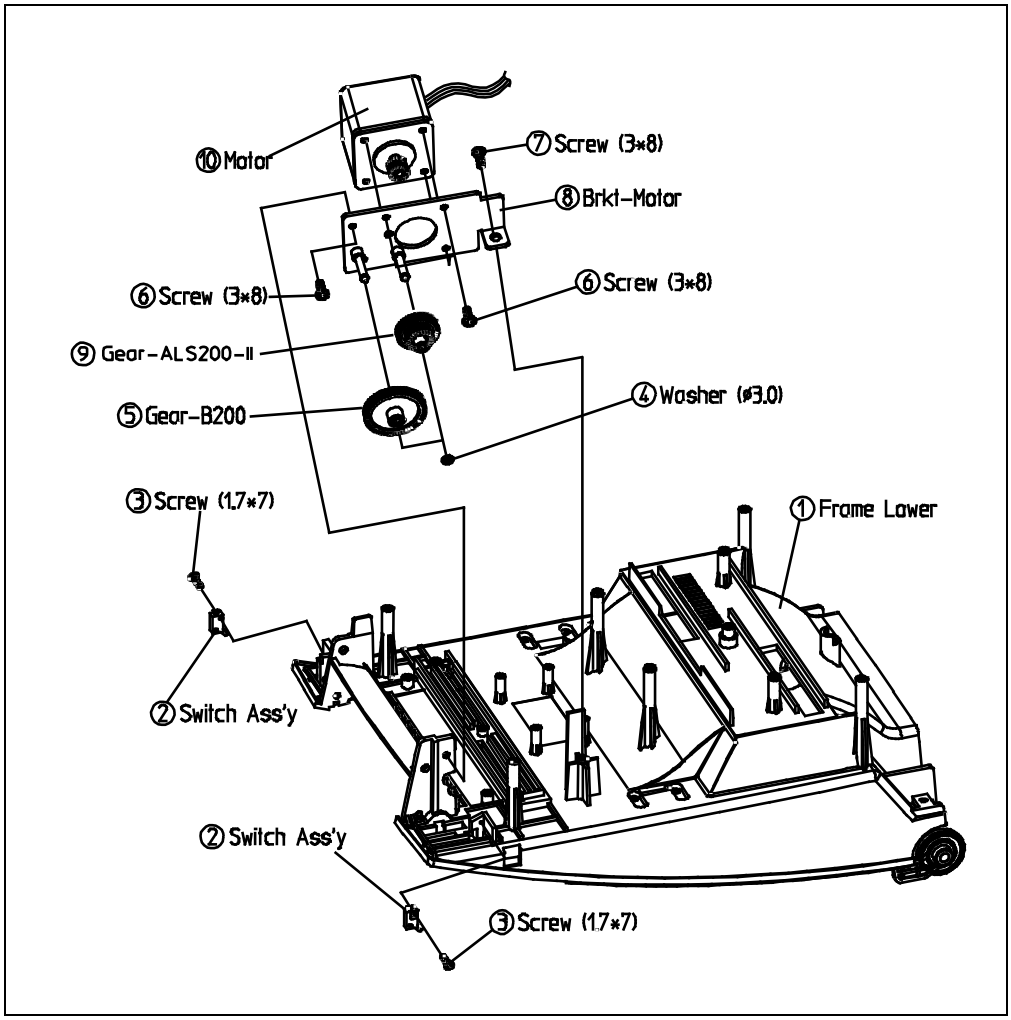
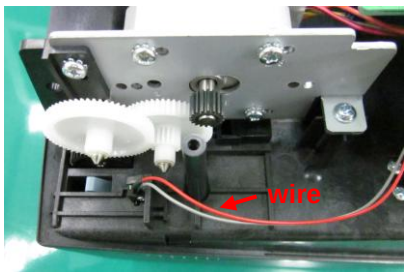


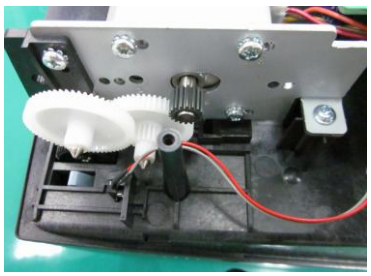
Figure 5-12 Disassembly Frame Lower #3

※ CAUTION

When replacing Switch Assembly, assemble the wire as below image.
Otherwise, wire could get damaged by gear.



Normality



Non-normality

5-4-4 Sensor BM Down Assembly Block

1) Remove the two Screws②.
2) Separate the Cover Rack③, the Gear Continuous④ and the Gear Rack⑤ from the Frame Lower①.
3) Remove the four Screws② and separate the Cover BM Down Assembly⑥.
4) Remove the E-Ring⑦.
5) Separate the Parts⑧~⑪ from the Cover BM Down Assembly⑥.

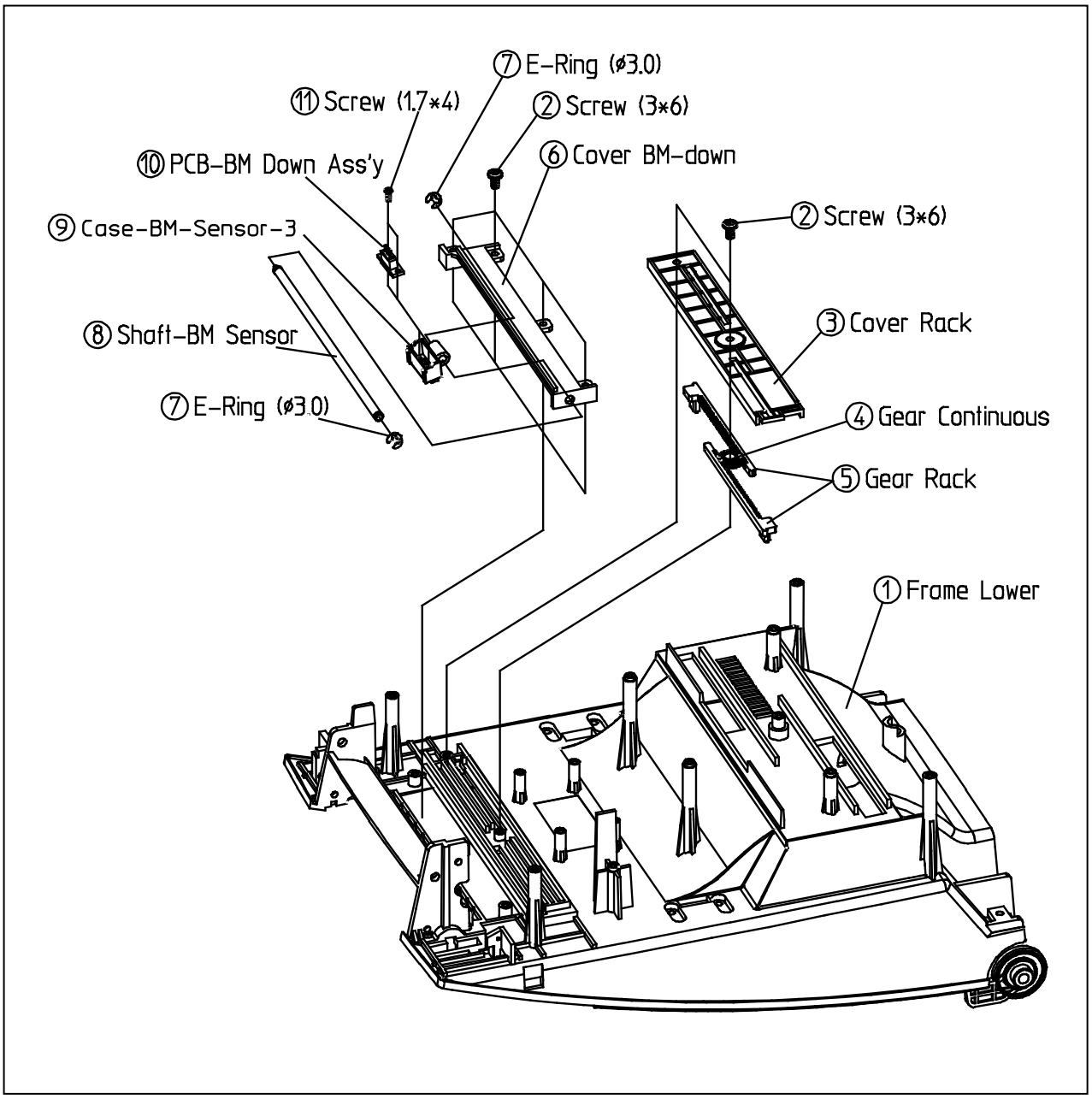


Figure 5-13 Disassembly Frame Lower #4

6. Cleaning Head

Printing quality might be degraded by dust, foreign substance, adhesive substance, or other pollution materials stuck in the printer head or inside the printer.

When dirty, clean the print head as follows:

※ **CAUTION**

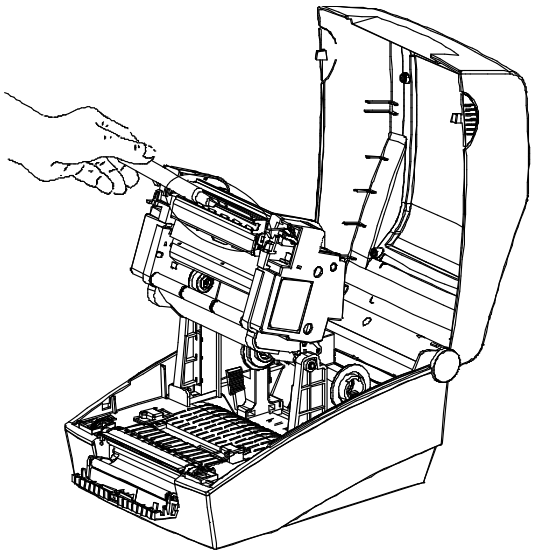
- Make sure to turn the printer power off prior to cleaning.
- As the print head gets very hot during printing, if intending to clean the print head, turn the printer power off and wait approximately 2~3 minute before commencement.
- When cleaning the print head, take care not to touch the heated portion of the print head.
  → Printer Head is susceptible to damage from static electricity, etc.
- Take care not to allow the print head to become scratched and/or damaged in any way.

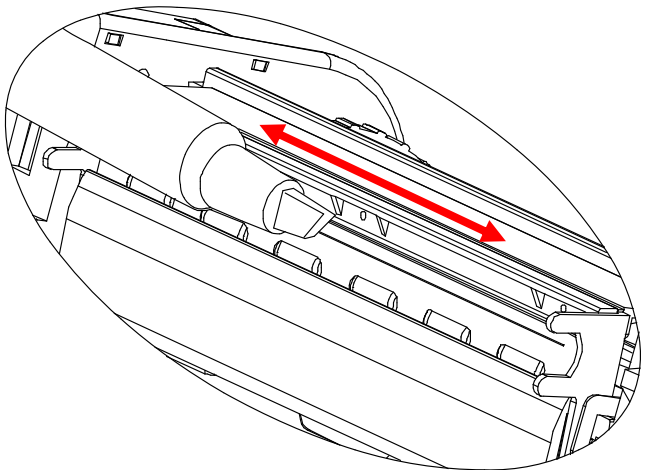
6-1 Cleaning Head

1) Open the paper cover and Ribbon Assembly and then use the cleaning pen to clean the head in the direction from the center of the head to the edges.

2) After cleaning the head, do not use the printer until the alcohol used for cleaning evaporates completely (1~2 min) and the printer has completely dried.

※ Perform the cleaning process each time the paper roll is replaced to prevent print quality deterioration.





6-2 Cleaning Sensors, Roller or/and Paper Path

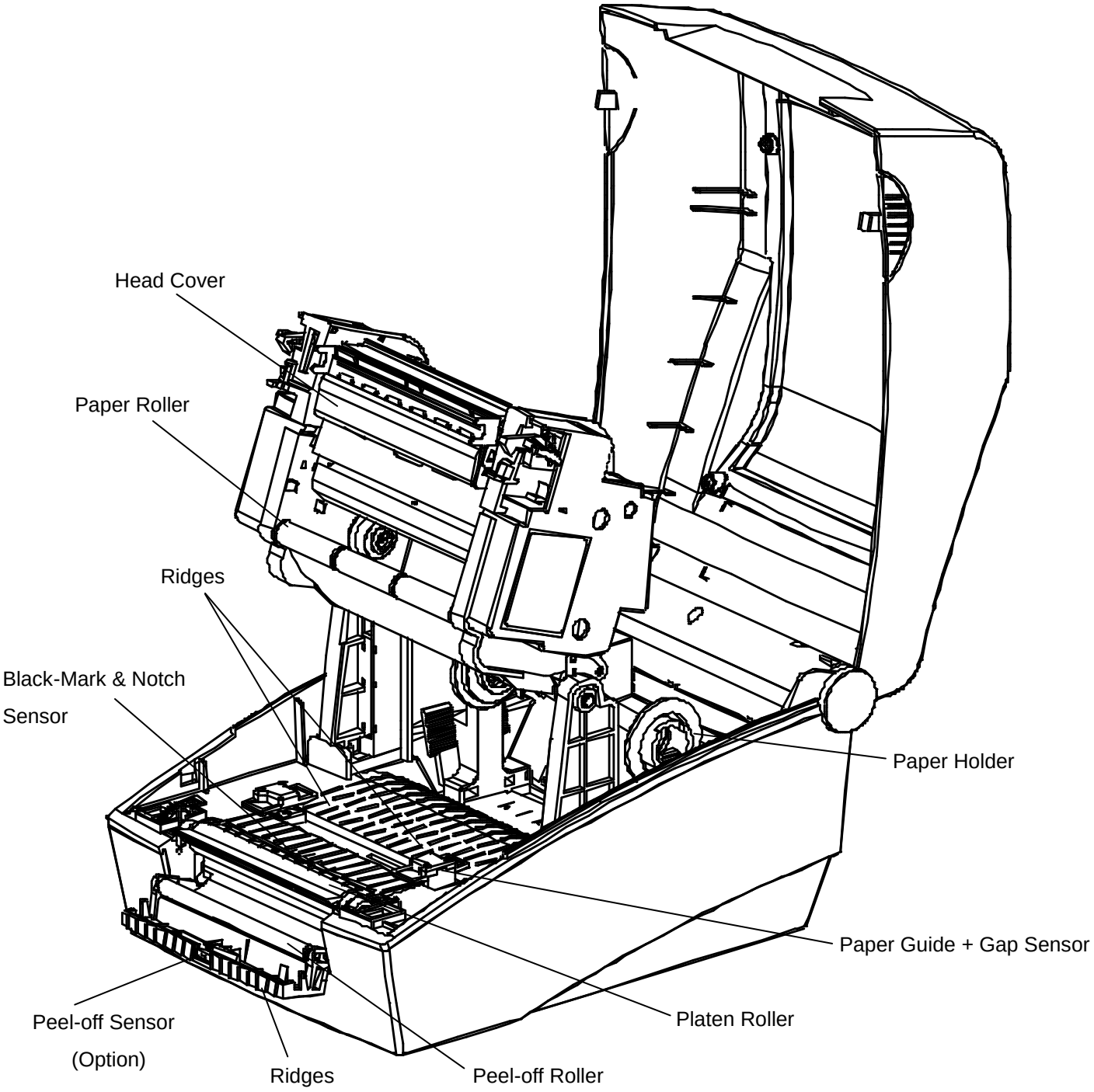
1) Open the paper cover and the Ribbon Assembly, and remove the paper and ribbon.

2) Remove any dust or foreign substance using dry cloth or cotton swab.

3) Soak the cloth or cotton swab in alcohol for medical use and use it to remove adhesive foreign substances or other pollution materials.

4) After completing the parts, do not use the printer until the alcohol evaporates completely (1 – 2 min) and the printer has completely dried.

※ Clean the parts when there is a degradation of performance in printing quality or paper detection



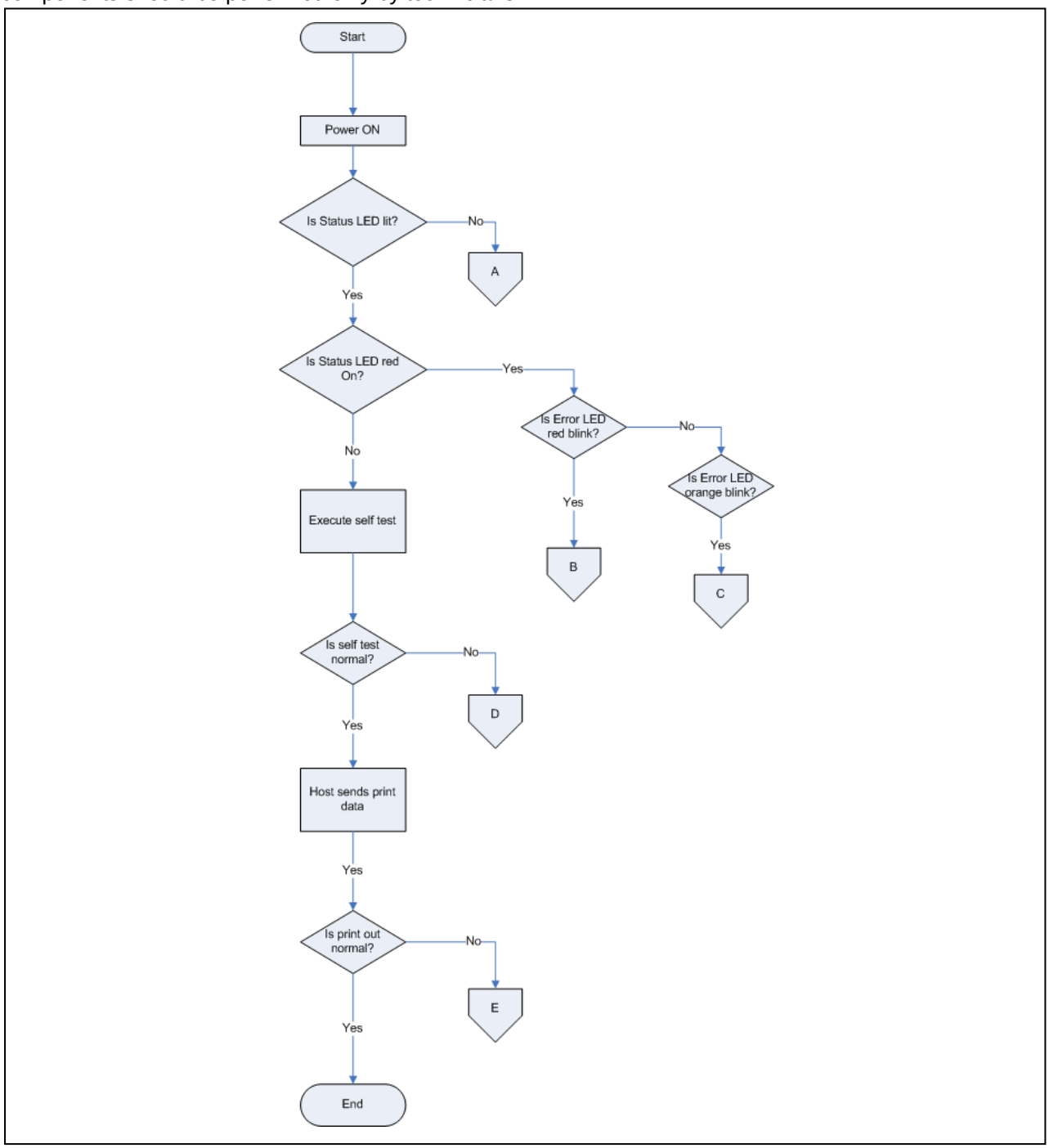
7. Troubleshooting

This character describes the methods for troubleshooting in this Label Printer.

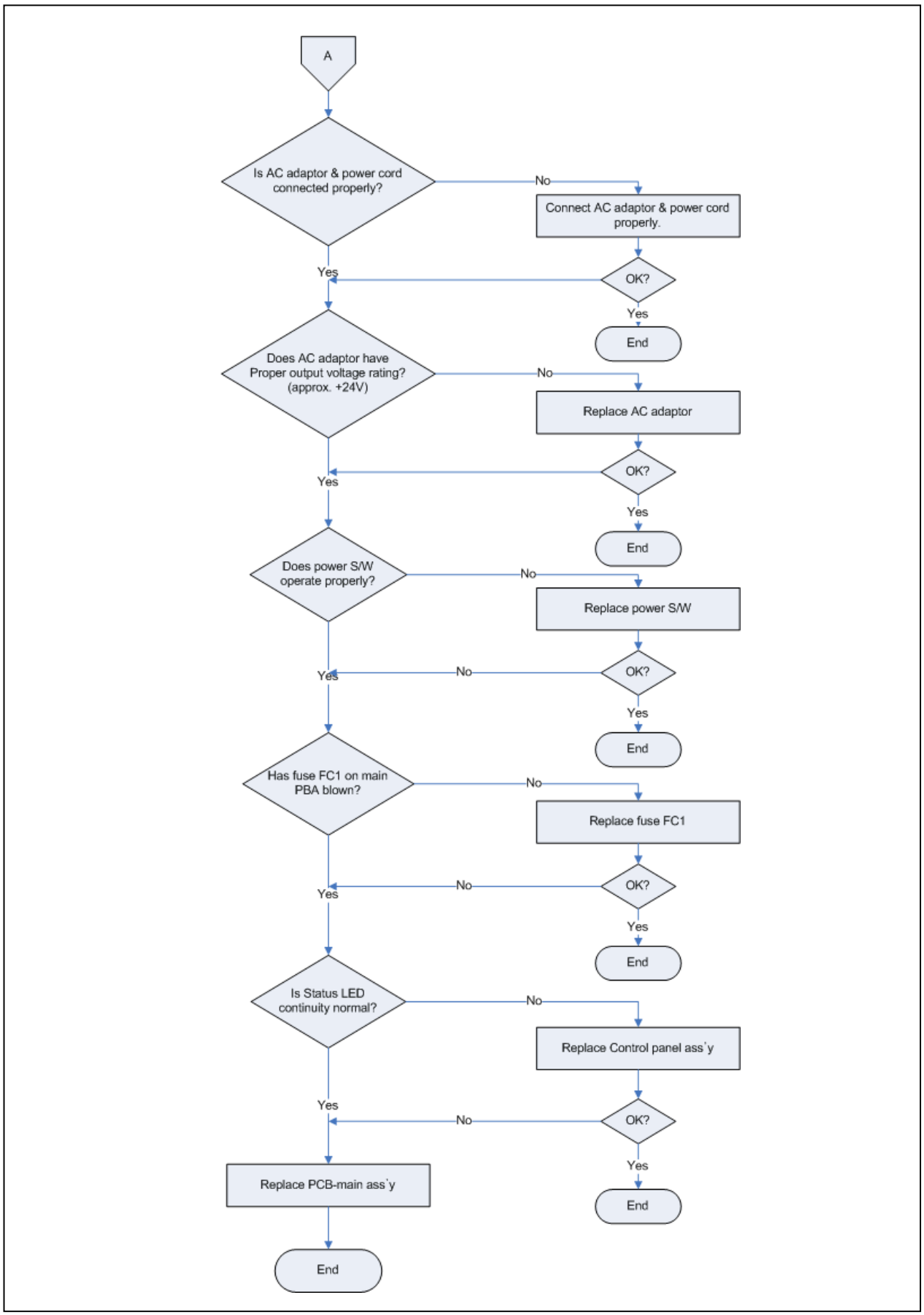
• Troubleshooting flow chart
  When the source of the problem is not clear, use the flowchart to find and replace a defective component.
• Troubleshooting tables
  Follow the steps outlined in these tables to repair a defect whose symptoms are known.

7-1 Trouble shooting flow chart

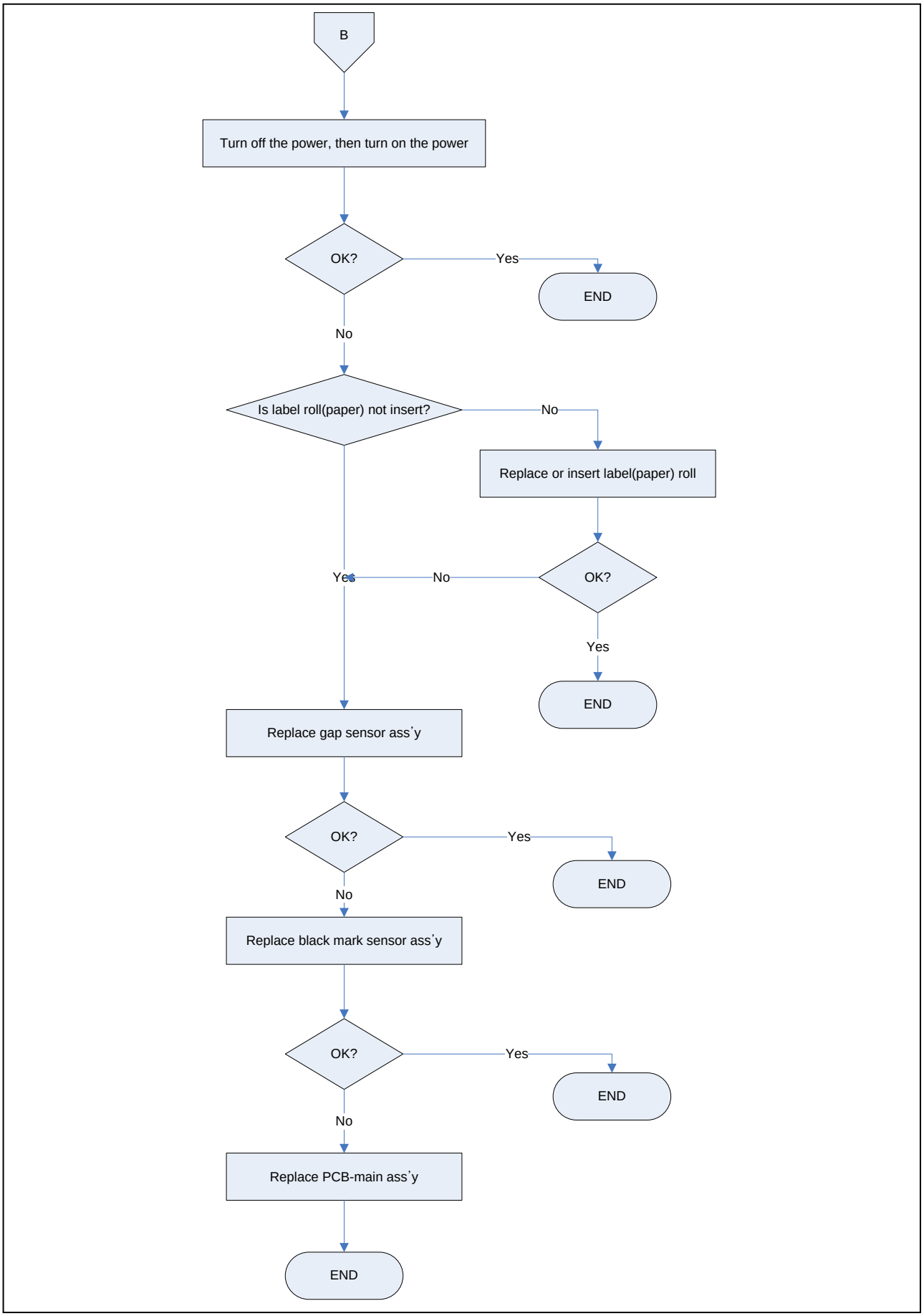
If the source of a problem is not clear, use the flowchart below to find and replace a defective component. Normally, servicing should be performed by component replacement. Repairs of the PCBs and other components should be performed only by technicians.



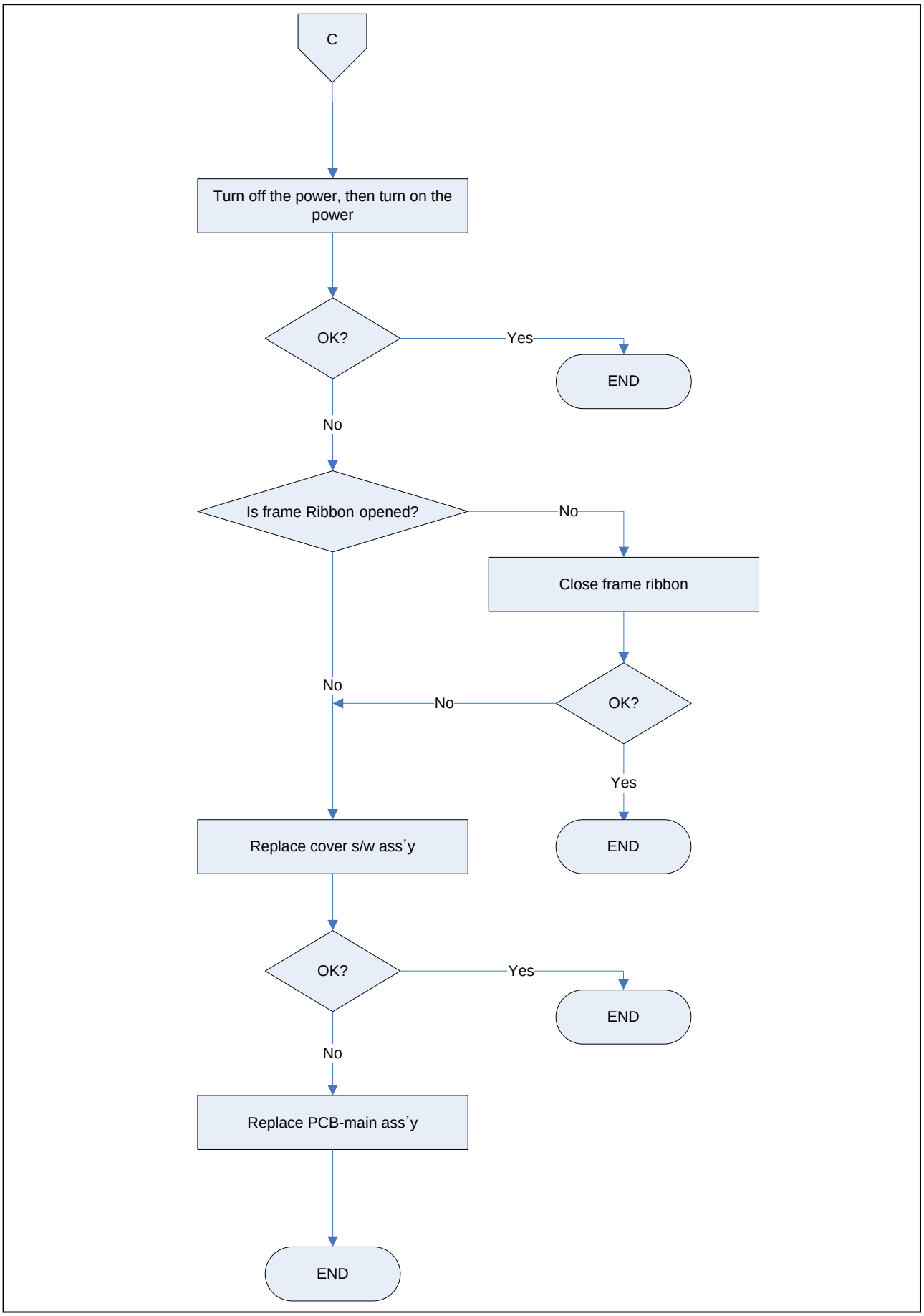
7-1-1 Status LED dose not light



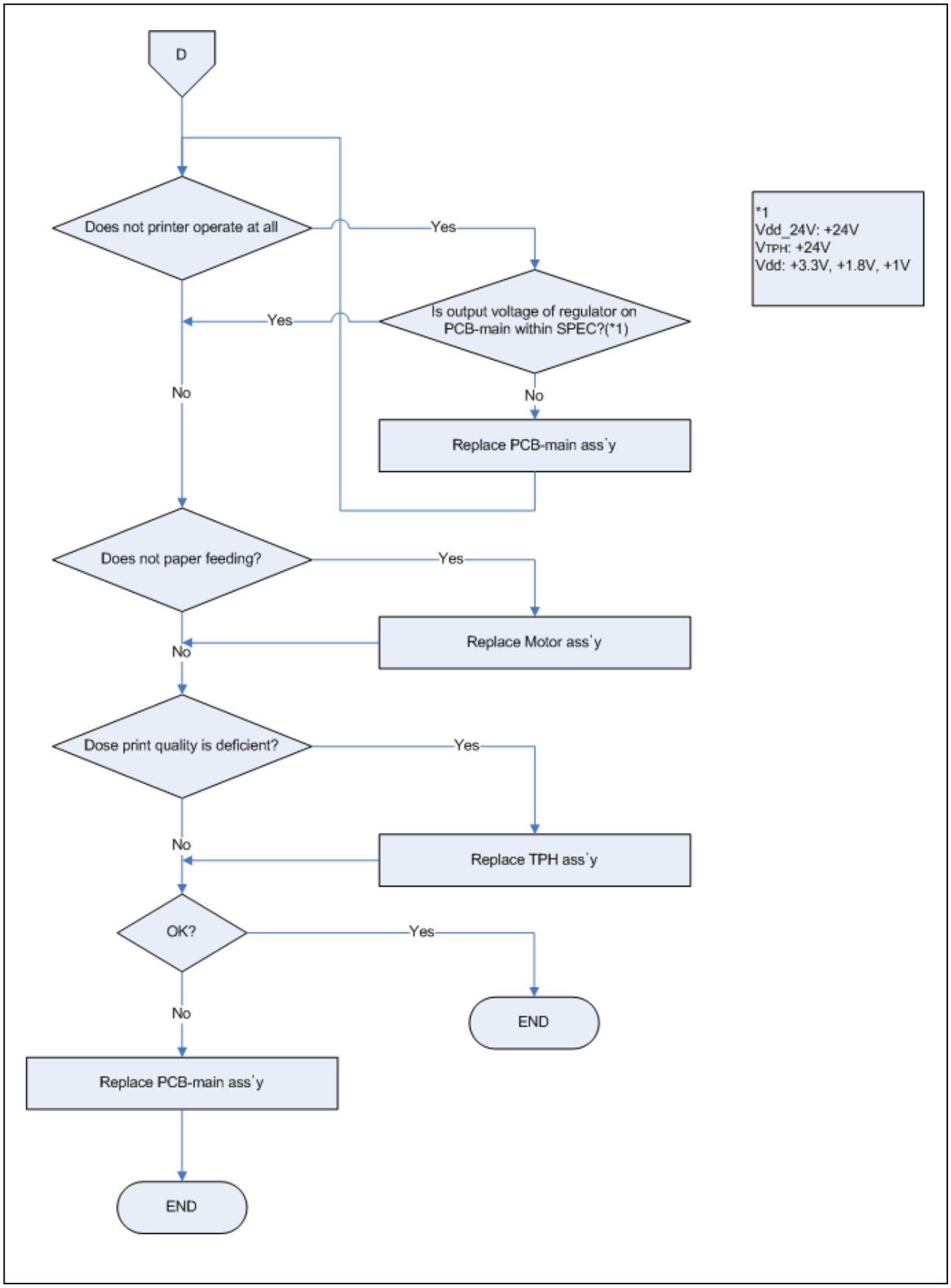
7-1-2 Error LED is red blink



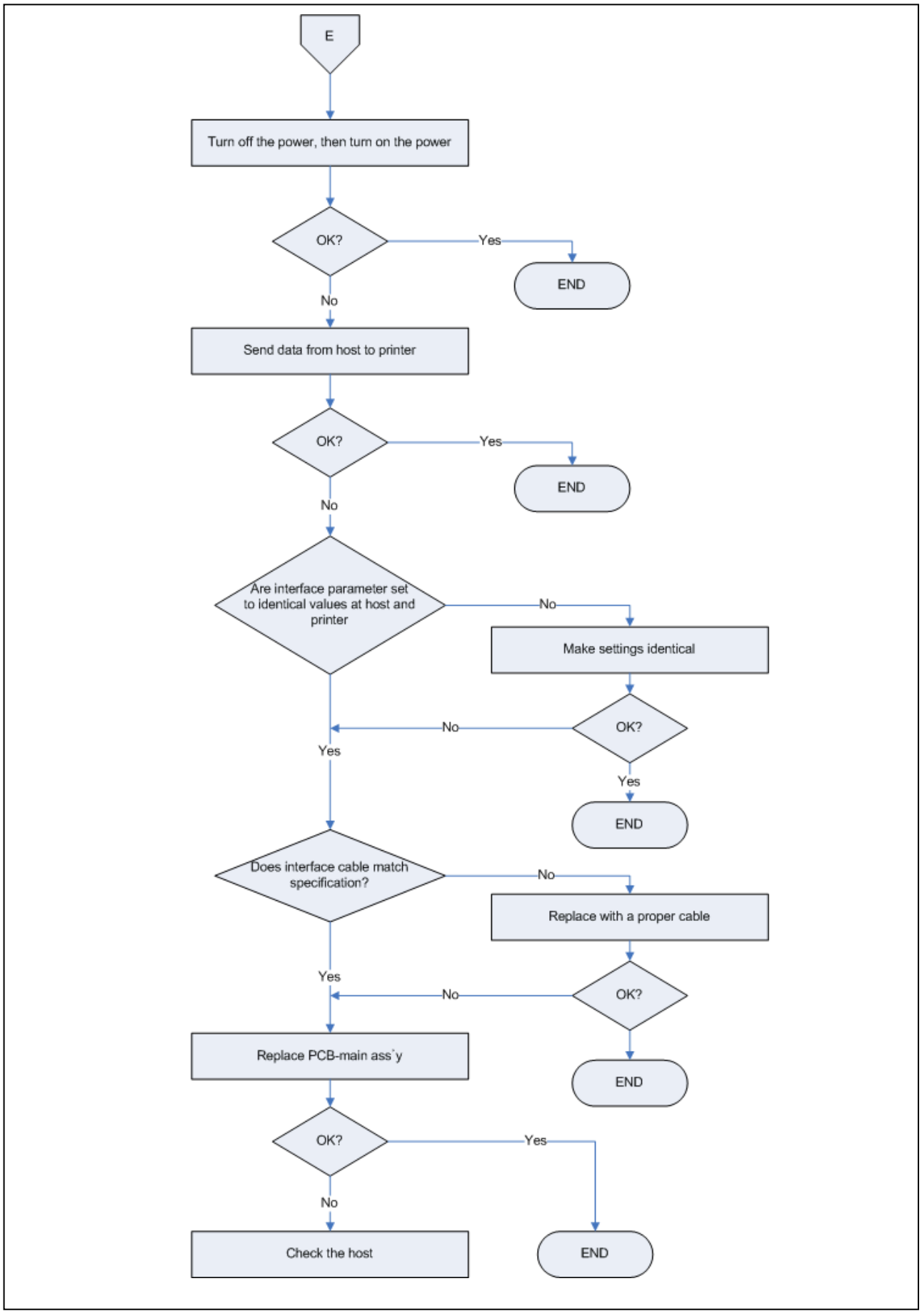
7-1-3 Error LED is orange blink



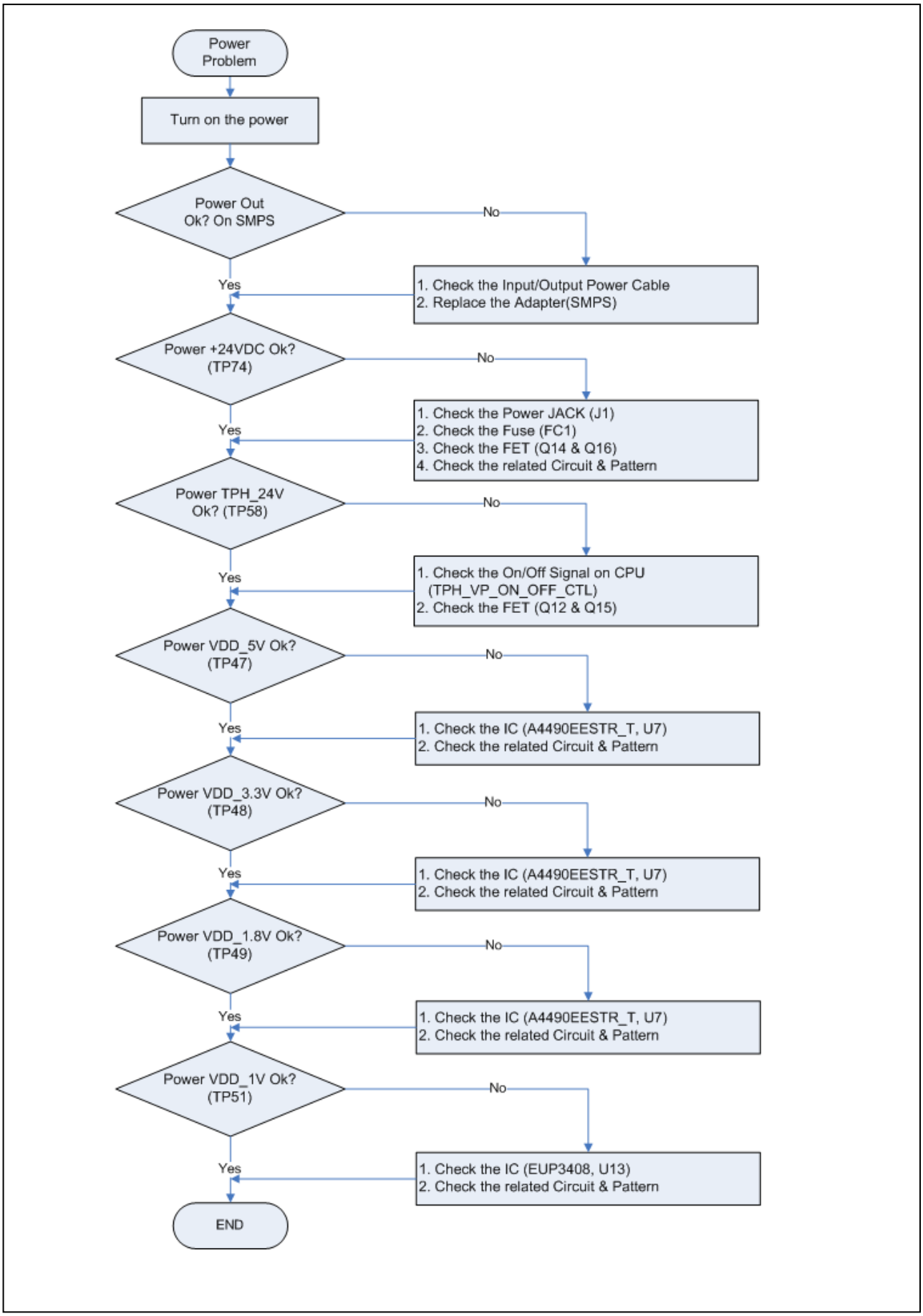
7-1-4 Self test is not normal



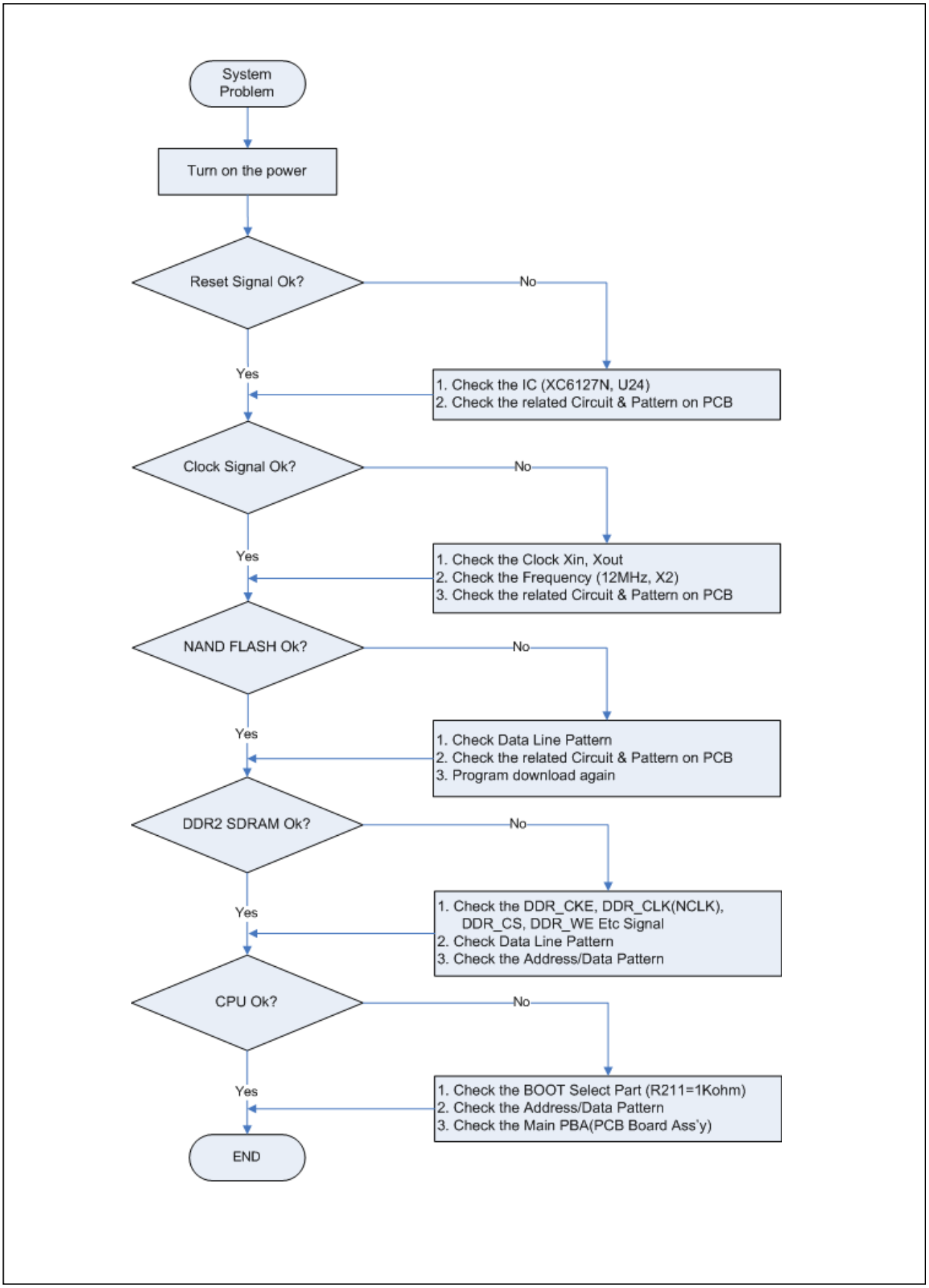
7-1-5 Data from host is not printed normal



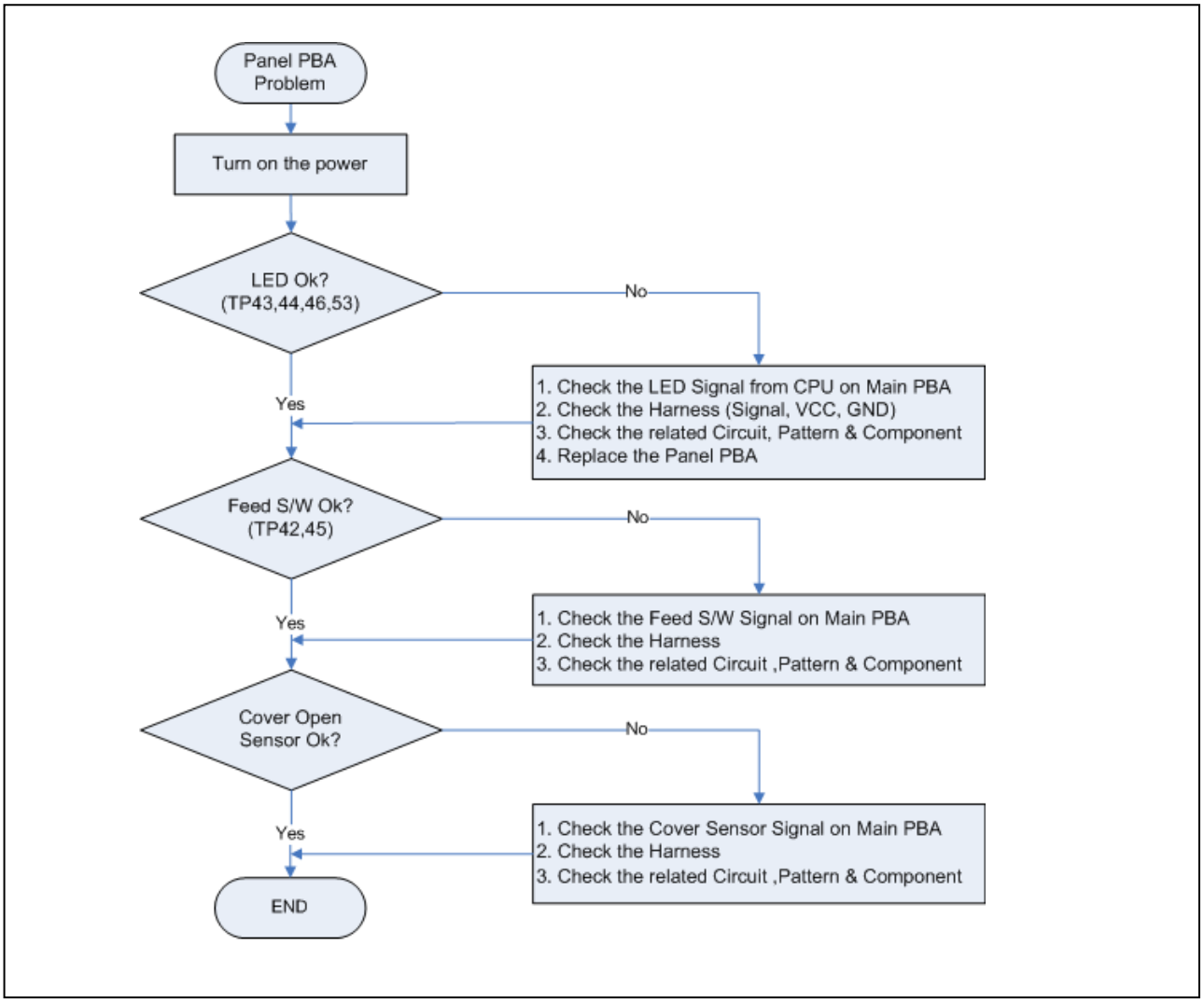
7-2 Power Problem

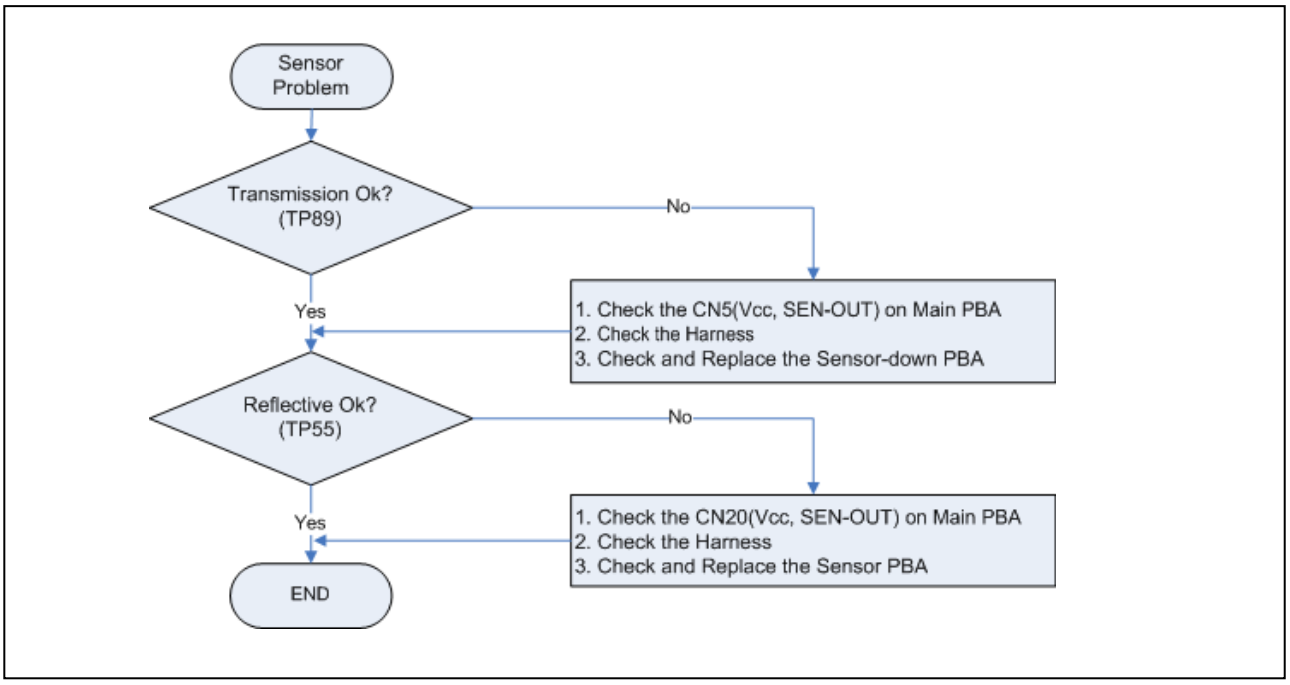


7-3 System Problem

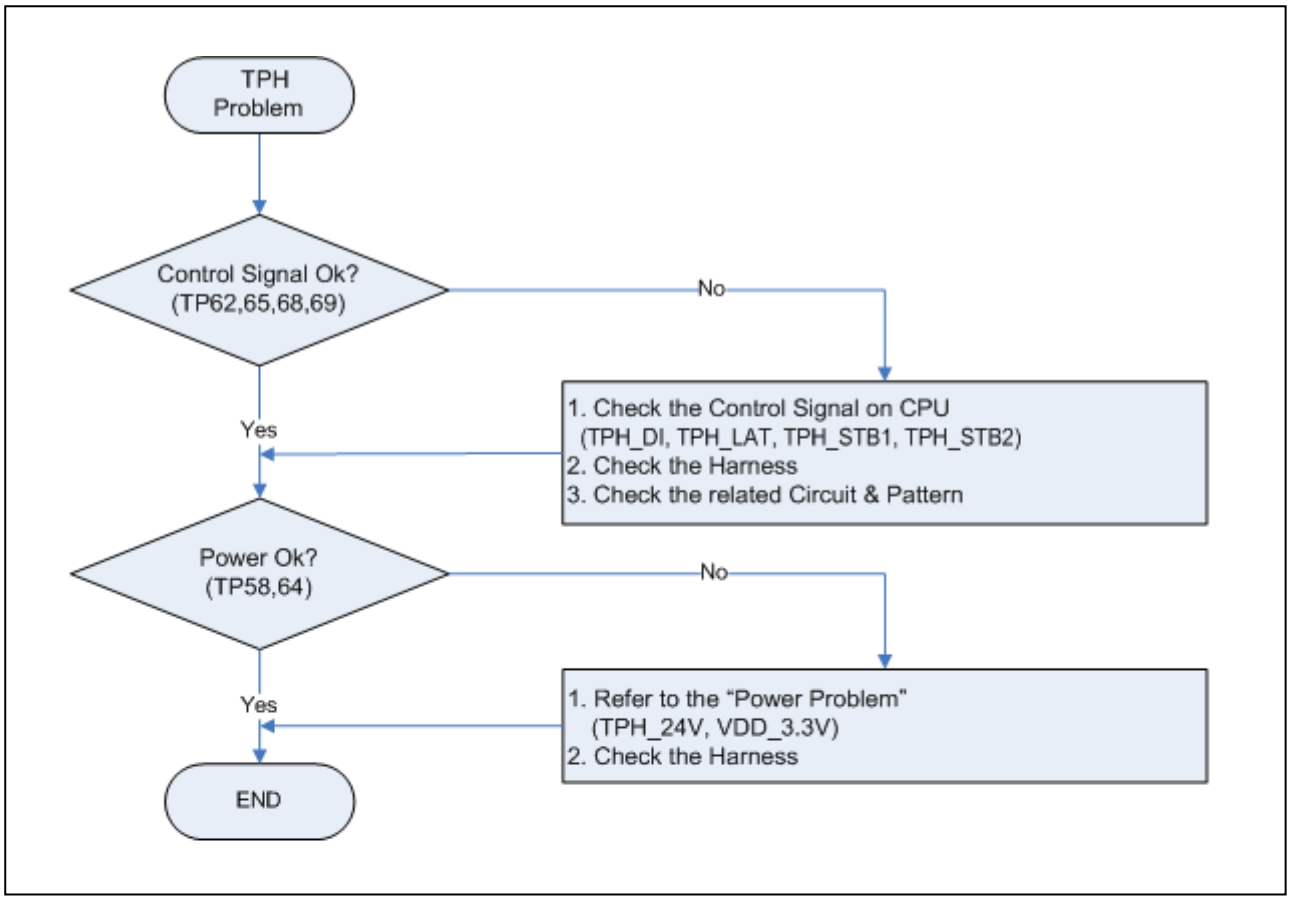


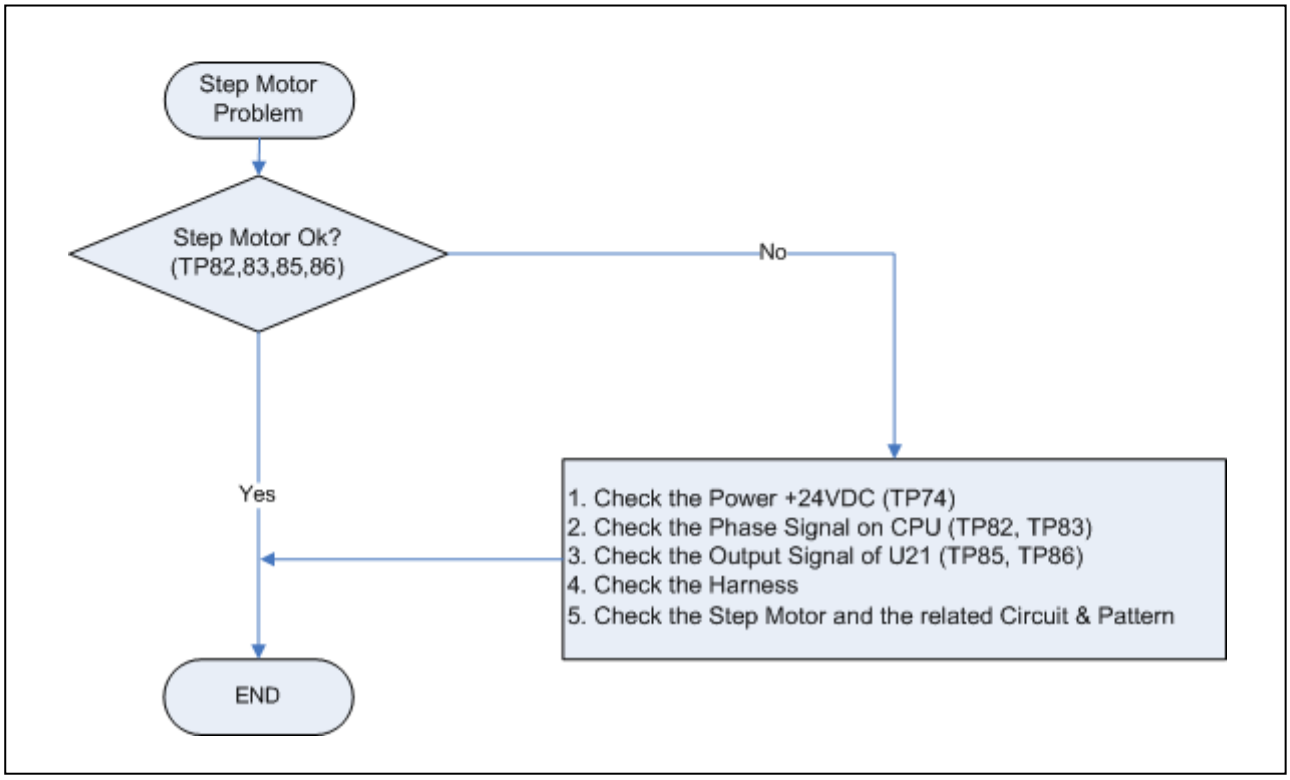
7-4 Panel PBA and Media Sensor Problem



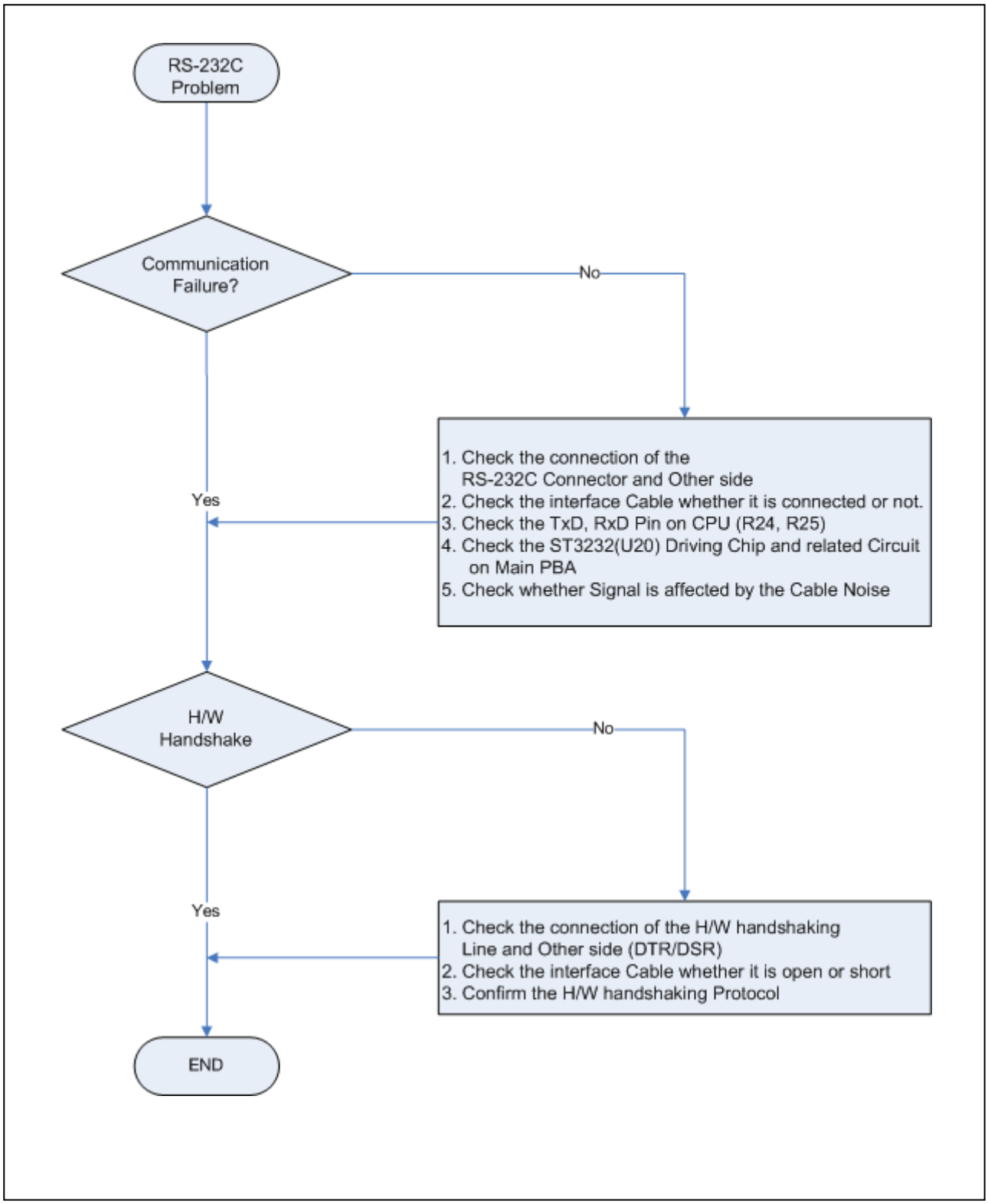


7-5 Thermal Printer Head and Step Motor Problem

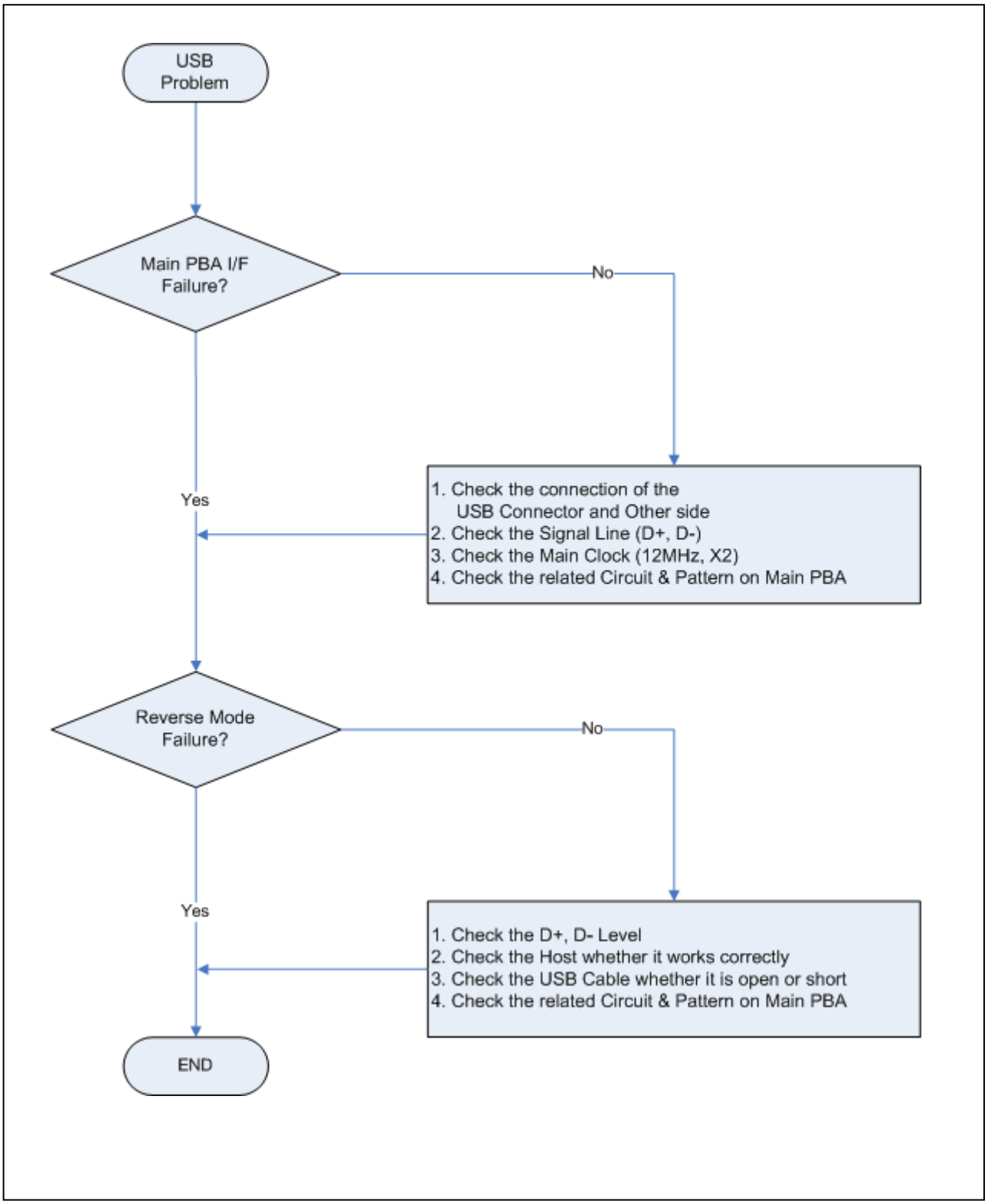




7-6 RS-232C Serial Communication Problem



7-7 USB Communication Problem



7-8 Ethernet Communication Problem