Service Manual

Label Printer

Ver. 1.01   **SRP-E770III**

■ Table of Contents

Ver. 1.01

■ About

About this Manual
This Service Manual describes how to perform hardware service maintenance for the BIXOLON
SRP-E770III 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.

■ Overview of this Label Printer

This System Label Printer is a ATMEL processor-based system, using a 32 bit-Atmel 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.
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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
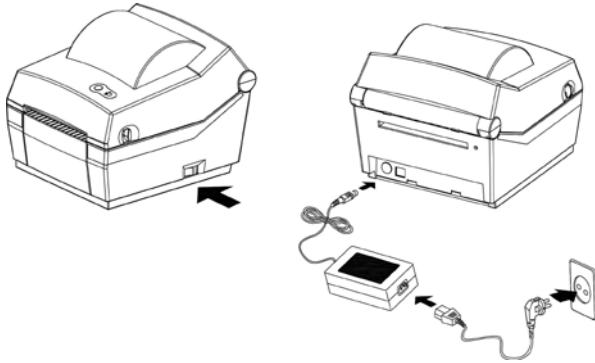
1) Turn off the printer power switch.

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)
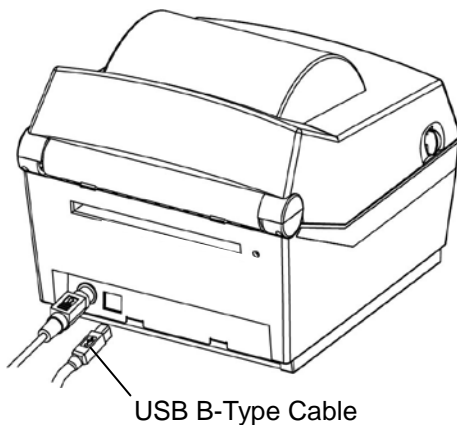
1) Turn off the power switch.

2) Connect the communication cable to the printer communication port to be used.
  - Connect USB B-Type cable to the USB port. (This port requires a shielded cable less than 1.8m long.)

USB B-Type Cable

2-1-3 Interface Cable Installation(Serial Model)
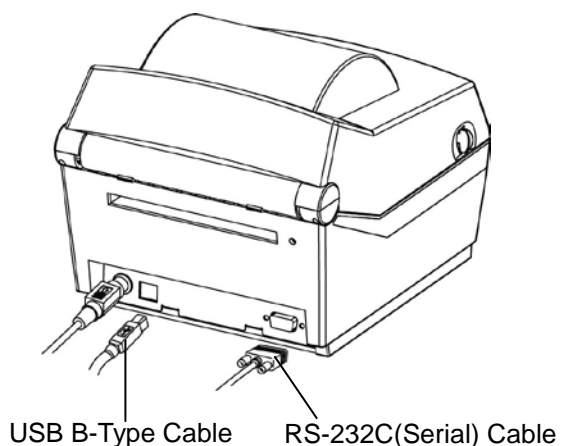
1) Turn off the power switch.

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.(This port requires a shielded cable less than 1.8m long.)
  - Connect USB B-Type cable to the USB port. (This port requires a shielded cable less than 1.8m long.)

USB B-Type Cable   RS-232C(Serial) Cable

2-1-4 Interface Cable Installation(Ethernet Model)
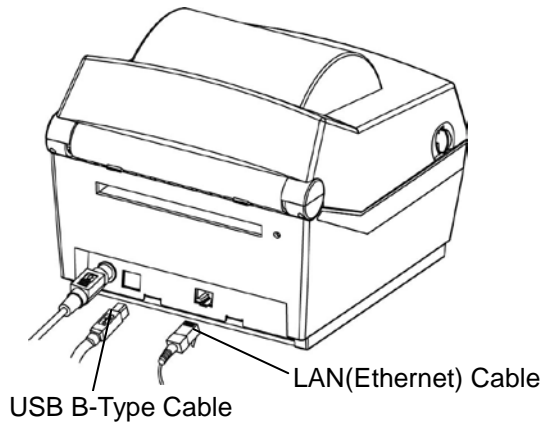
1) Turn off the power switch.

2) Connect the communication cable to the printer communication port to be used.
- Connect the LAN(Ethernet) Cable to the ETHERNET port.(This port requires a UTP cable(CAT5 or higher) less than 3.0m long.)
- Connect USB B-Type cable to the USB port. (This port requires a shielded cable less than 1.8m long.)

LAN(Ethernet) Cable

USB B-Type Cable

2-1-5 Paper Installation

1) Open the Paper Cover.
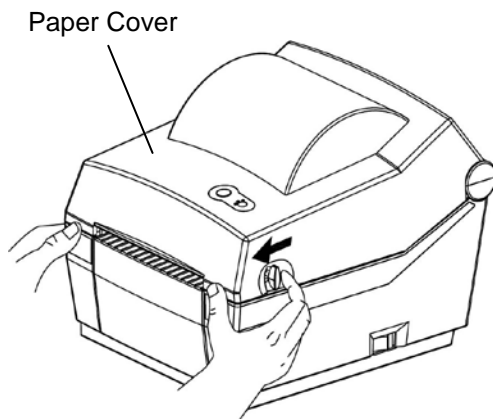
2) Spread the paper holder and insert paper as shown.

Paper Cover

Paper Holder
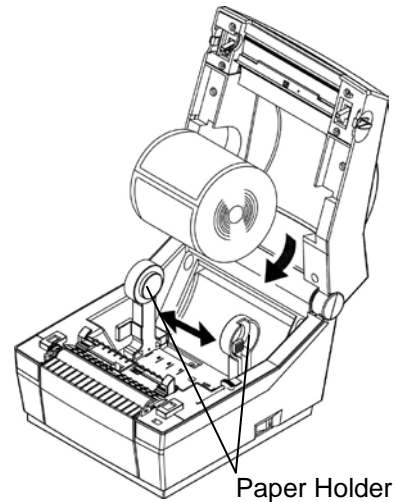
3) Whether the paper label is wound inwards or outwards, its printing surface must face up.
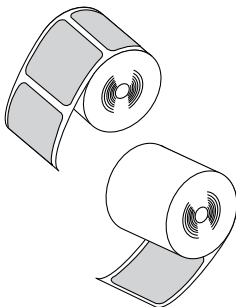
4) Adjust the paper guide to the width of the paper.
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Paper Guide
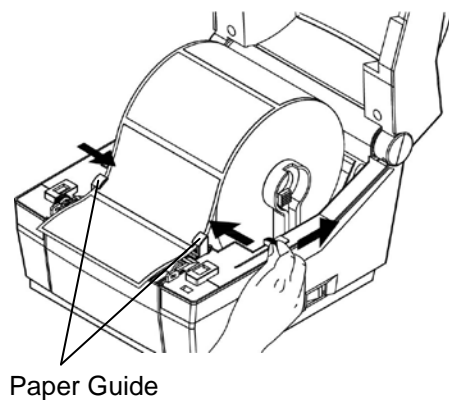
5) Close the Paper Cover until a click sound is heard.

2-2 Operations

2-2-1 Using the operation panel
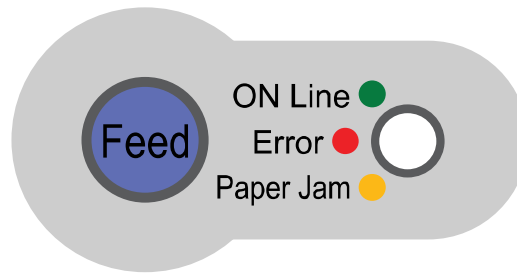
Feed button   Paper feed or cancel the print job.

LED   The current printer status can be viewed. (Refer to below)

The current printer status can be viewed via the printer's LED display.

1) Green LED on
   - The printer waits for the data from Host (PC) in normal mode.

2) Orange LED on
   - It means paper gap sensing error. It becomes on when the printer fails to detect the
     paper or paper jam occurred. When fails to detect the paper correctly use
     Auto-Calibration function.

3) Red LED on
   - The printer has stopped by pressing FEED button. It restarts printing when pressed again.

4) Green LED blinking
   - TPH (Thermal Printing Head) overheated or ;
   - The printers is waiting for the button input to run Auto-Calibration function.

5) Orange LED blinking
   - No paper. Make sure the paper is loaded correctly.

6) Red LED blinking
   - The printer cover is open.

2-2-2 Feed Button Operations

Feed Button can be used for various purposes as follows.

1) Feed Label
   In Print Standby mode, pressed for shorter than 3 seconds, the printer feed one label.

2) Stand-alone Configuration Mode
In Print Standby mode, pressed for longer than 3 seconds, the printer enters into Stand-alone Configuration Mode. Please refer to 5-1 for details.

3) Pause and Resume printing
   If pressed while printing labels, Printing toggled between Pause and Resume.

2-2-3 Self-Test

The self-test checks whether the printer has any problems.
(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 holding down the FEED button.   The self-test begins.
   (It takes about 5 seconds before starting self-test)

3) The self-test prints the current printer configuration information.

4) After the self-test results are printed out, a printer enters into Print Standby Mode.

2-2-4 Stand-alone Configuration Mode

Various modes can be executed by using button and LED status.

Please take following steps to start Stand-alone Configuration Mode and execute each function.

1) Make sure that a printer is in Print Standby Mode.
2) Depress the Feed button for about 3 seconds, then the LED changes to orange color.
3) Release the Feed button, then the printer starts the Standalone Configuration Mode and
   6 numbers of LED status changes sequentially.
4) When the Feed button is depressed at specific LED status, the corresponding operation
   will be executed.

Function List of Stand-alone Configuration Mode.

Sequence Number	LED		Printer Operation
	Color	Status	
1	Green	Blink 3 times	NONE
2	Orange	Blink 3 times	Factory Reset and Gap Calibration
3	RED	Blink 3 times	Factory Reset and Black Mark Calibration
4	Green	Keep On	Toggle Power-up Auto-feed
5	Orange	Keep On	Data Dump Mode
6	Red	Keep On	Demo Mode

* This information can be printed out by printer self-test.

2-2-5 Pause/Resume

Press FEED button to pause at the middle of labels printing.

1) Press FEED once.

2) Printer stops after on-going printing and Red LED becomes on.

3) Press FEED once again. It resumes printing in a queue.

2-2-6 Factory Reset

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

How to reset the printer
1) Depress the feed button for two seconds during print standby mode.
2) LED will change to orange color and release the feed button.
   The printer will be set to stand-alone configuration mode.
3) Depress the feed button at the LED sequence in 2-2-4(Orange LED or Red LED 3times blink) to reset
   the printer to factory default settings, and media calibration function will be executed.

   - Orange LED 3times blink: Factory Reset and Gap calibration
   - RED LED 3times blink: Factory Reset and Black-mark calibration

2-2-7 Media Length Measurement

The printer needs to have the exact length of currently installed paper to make a proper print image.

For this, the printer automatically starts Media Length Measurement Mode in the following conditions.
   1) When the printer has no measure length, for example first feeding after installation.
   2) When the detected label length differs from the measured value.

In this mode, the printer feeds 2 or 3 labels to measure the exact length of label and saves the measured value on printer's non-volatile memory.

2-2-8 Media Sensor Auto-Calibration

Media sensor auto-calibration is used when the printer does not detect a gap or black mark on the label paper correctly.

Generally a printer is set to detect most types of gap or black mark but sometimes it fails to detect and keep feeding the paper without a stop when special paper used. In such case, use media sensor auto-calibration function for a proper detection.

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

2) Use Stand-alone Configuration Mode, Sequence Number 2 or 3(refer to 5-1)
   - Sequence Number 2: Gap Media Auto-Calibration
   - Sequence Number 3: Black Mark Media Auto-Calibration.

2-2-9 Gap Sensor Manual-Calibration

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.

Unified Label Utility-II installation files and manuals are provided on the BIXOLON official website. (http://www.bixolon.com)
Please refer to Unified Label Utility-II manual for details.

Please make sure the printer is connected and execute the utility program.
Please the Calibration Setting Manager Button after setting the interface type.
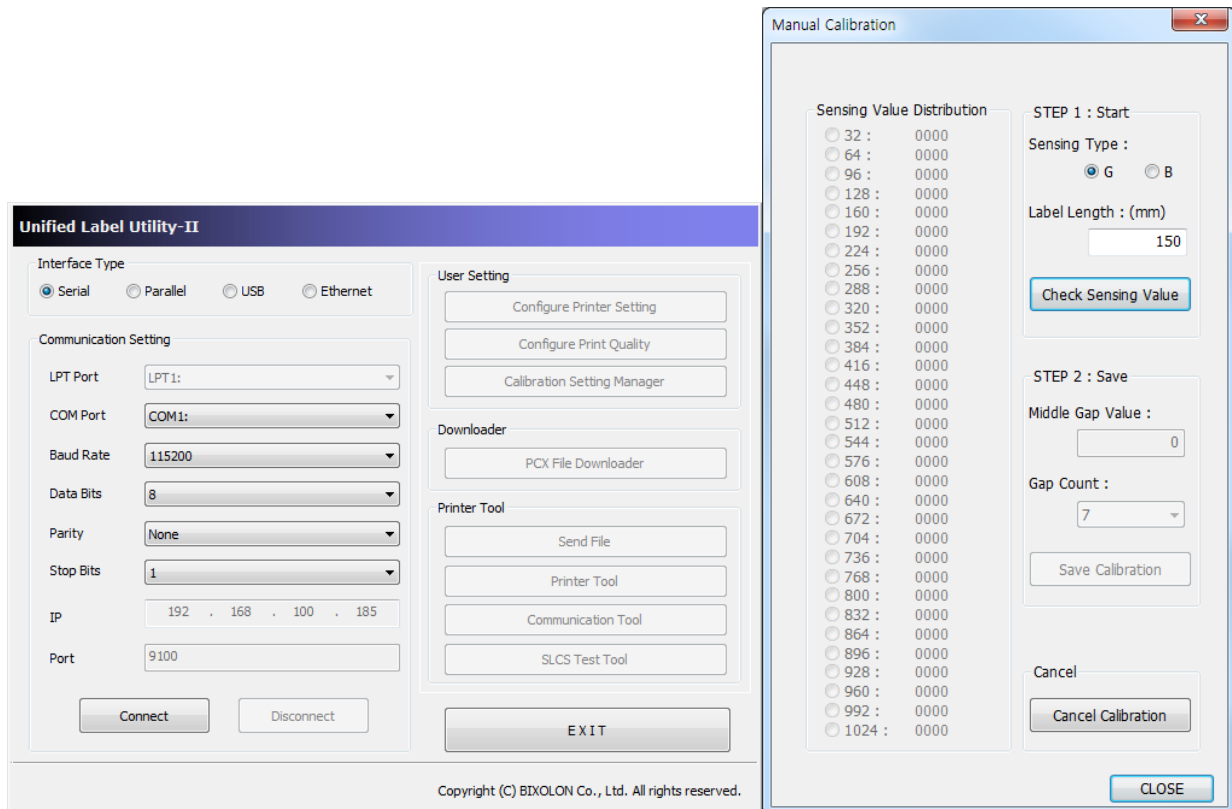
1) Select the sensing type and input the label length by millimeter and click on "Check Sensing Value" tap. Then printer starts to calibrate.

2) Printer will print the scanned values after calibration and the values will appear on the Screen.

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"

2-2-10 Data Dump Mode

This function can be used to diagnose the communication issues when the printer 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.

Use Stand-alone Configuration Mode, Sequence Number 5(refer to 5-1) to start Data Dump Mode.

2-2-11 The Peel-Off(Option)

This function is used to automatically separate labels from the liner.

1) Open the paper cover.

2) Open the peel-off cover and turn on the peeler switch.
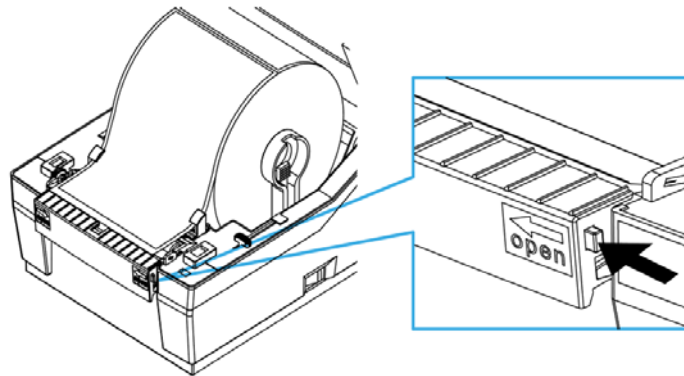
3) Check if the peeler LED is on.

LED
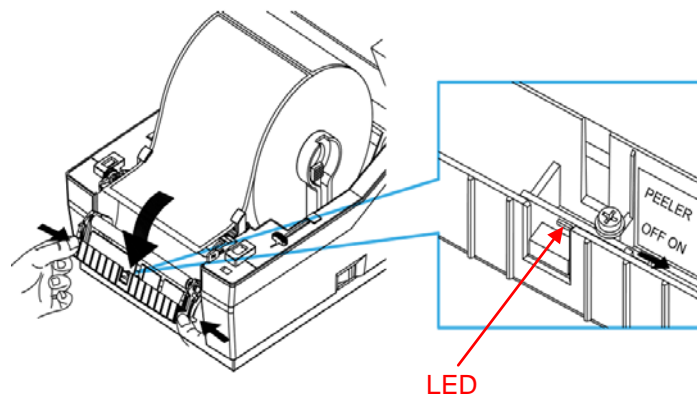
4) Remove the paper and insert the paper through the slot.
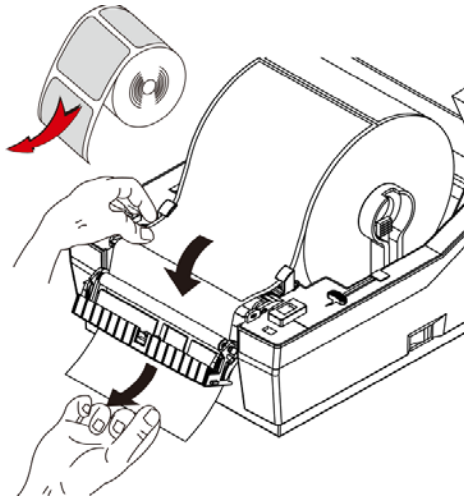
5) Adjust the paper guides and close the cover.
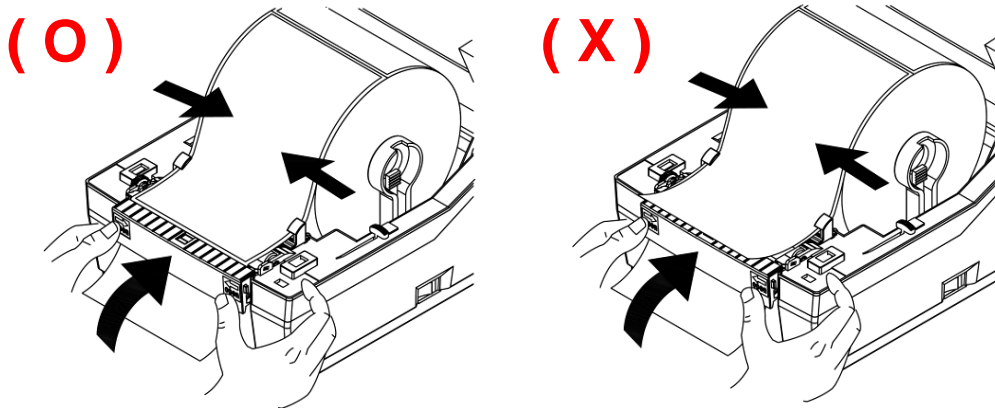
2-2-12 Using Fan-Fold Paper

Supplying paper to the printer externally is done as follows.

1) Insert the paper at the rear of the printer and then open the Paper Cover.
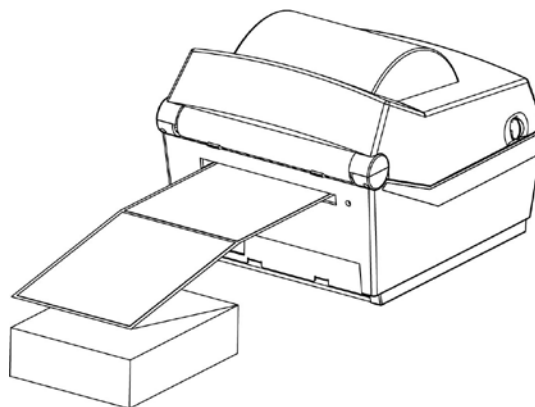
2) Adjust Paper Holders to the paper width by using the Fix Tool.

Fix Tool
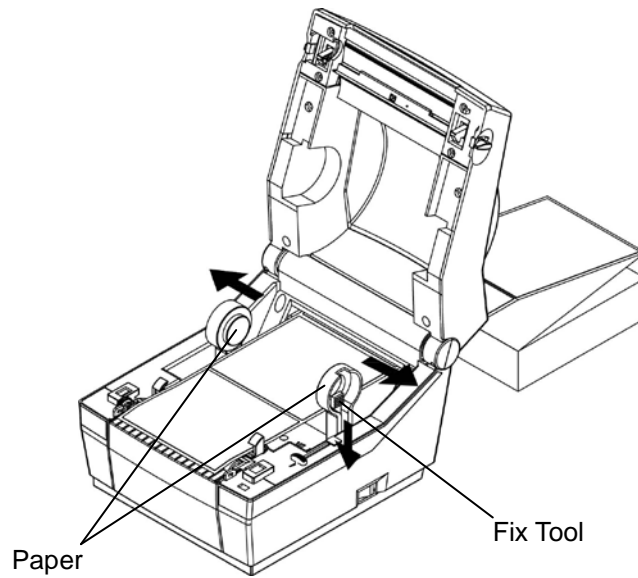
Paper

3) Adjust Paper Guides and close the Paper Cover until a click sound is heard.

Paper Guide
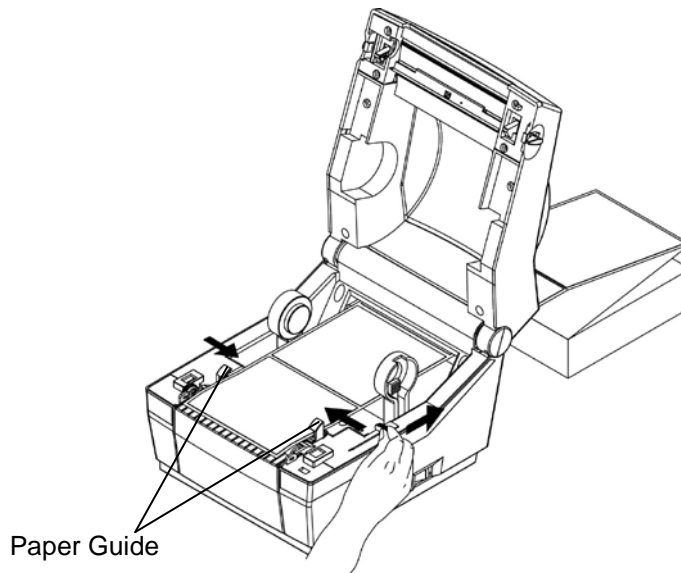
2-2-13 Firmware Download

There are two ways to download firmware.

1) Normal firmware download
   Used to change firmware with the updated version.
   Please refer to the "Firmware download manual".

2) Emergency firmware download
   Used to revive the main board in case that the printer is out of order.
   Please refer to the "Emergency Firmware download manual".

3. Product Specifications

3-1 Appearance

3-1-1 Printer Dimensions (mm)
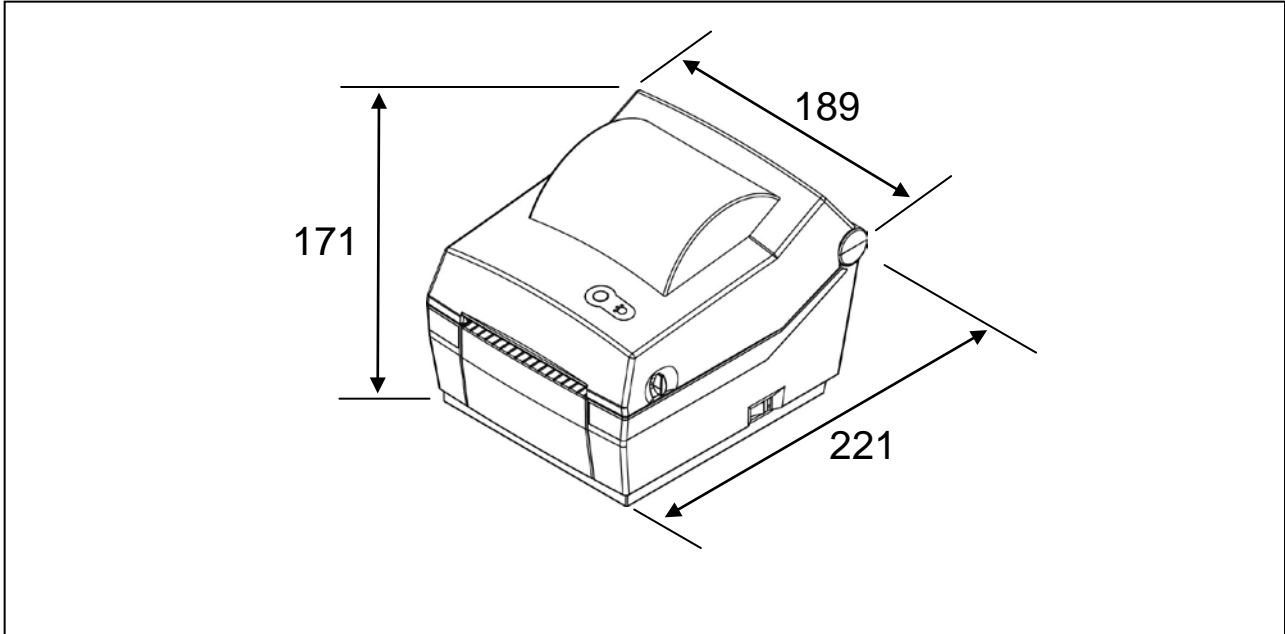
Figure3-1 Printer Dimension

3-1-2 AC/DC Adapter Dimension (mm)
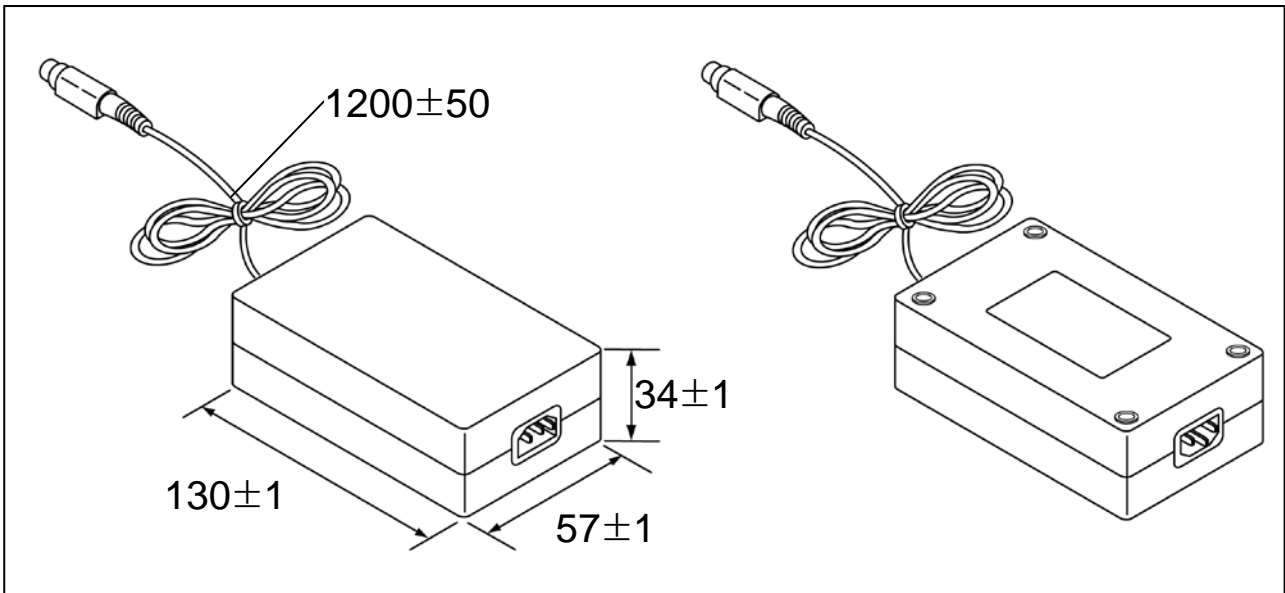
Figure3-2 AC/DC Adapter Dimension

3-1-3 Feature Locations

Feed Button

Power Switch

Cover Lever

Printer Head

Paper Cover

Paper Gap Sensor

Paper Holder

Cover STD

Paper Guide

Fan-Fold

Power Jack

USB B-Type

Label Peel-off(Option)
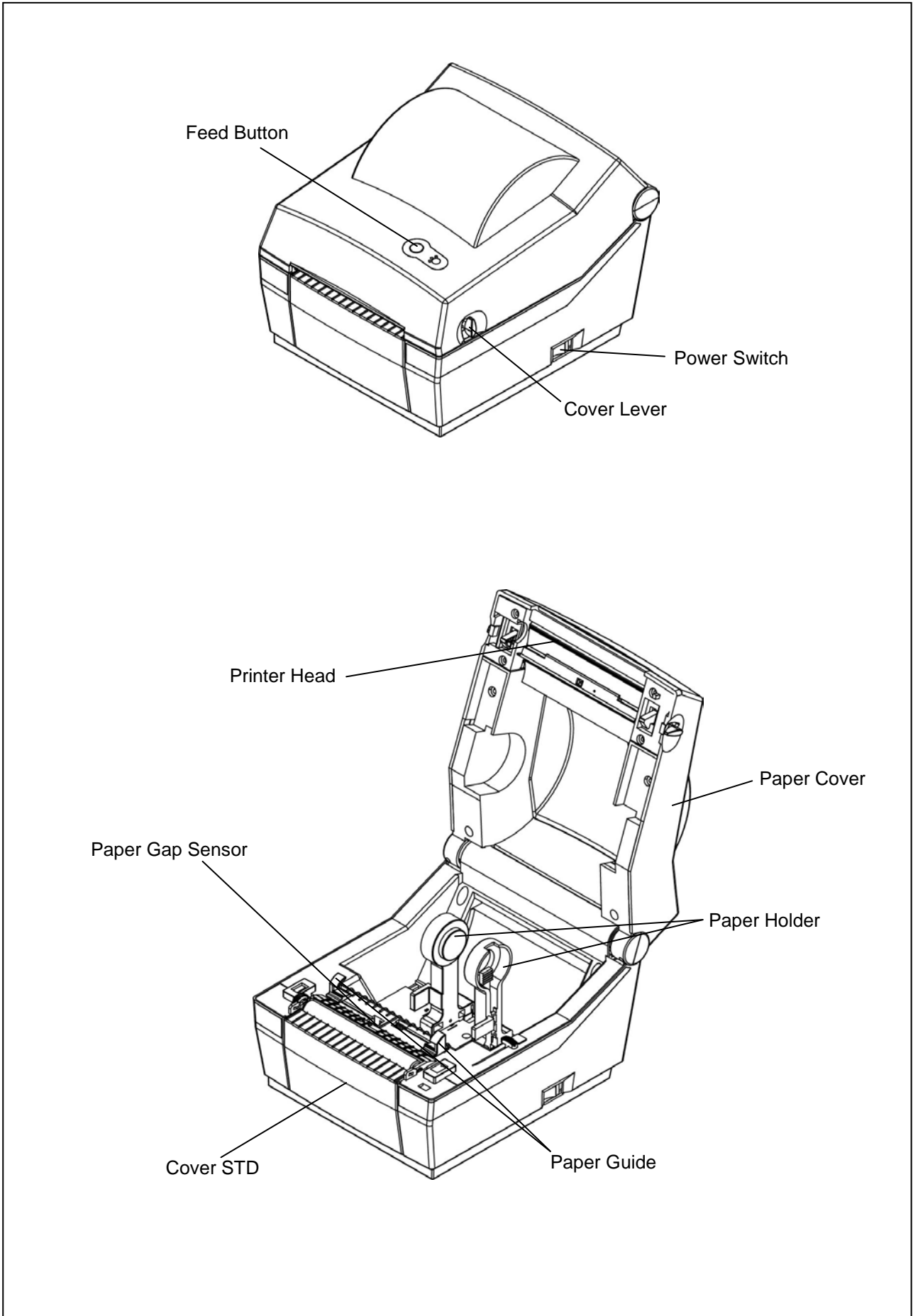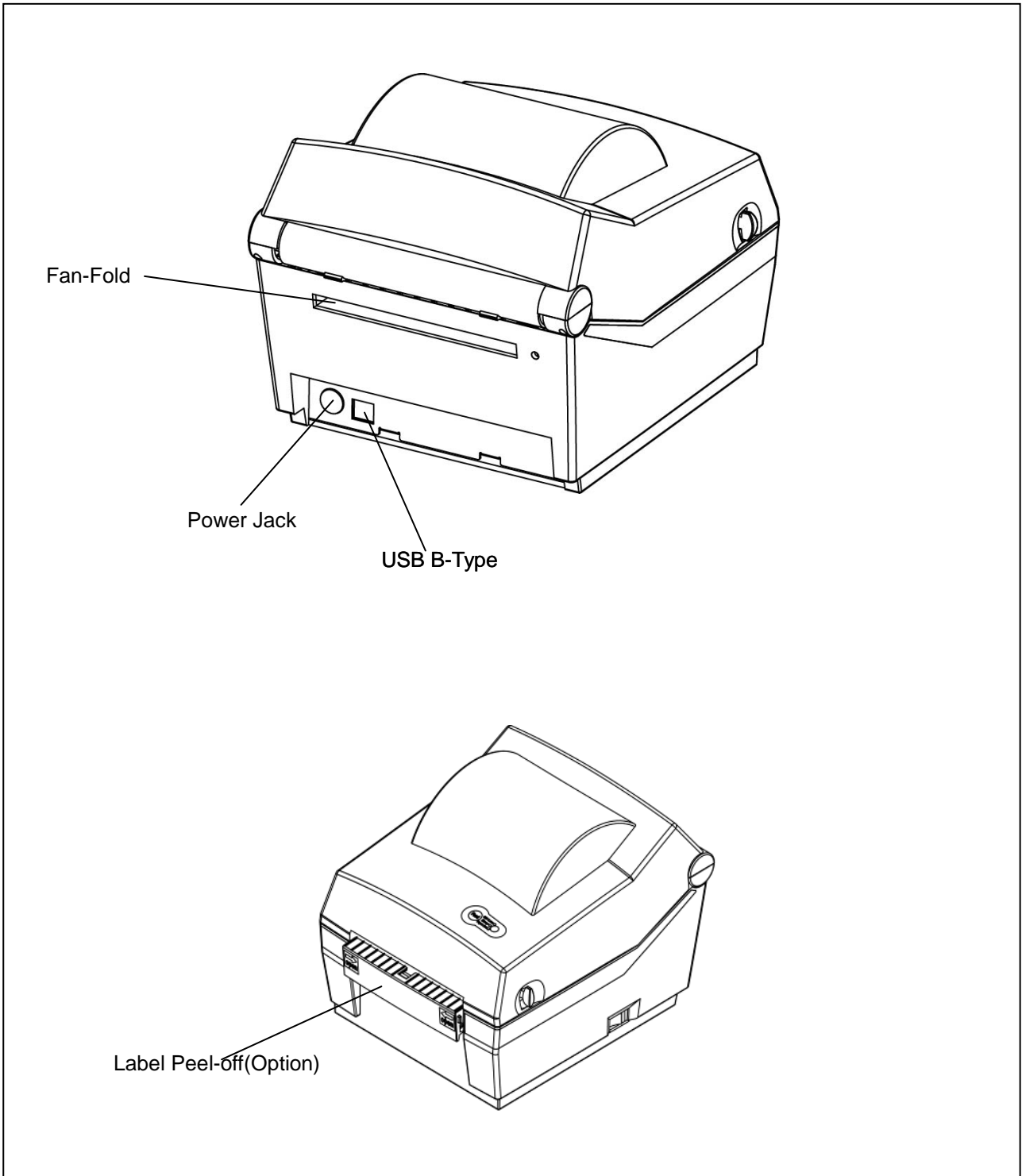
Figure3-3 Feature Location

3-2 General Specifications

3-2-1 Hardware Specifications

Item	Description	Remark
Product	• SRP-E770III Label Printer	
Processor	• Atmel AT91SAM9G45 (32 bit)	
Memory	• SRAM : 64MB DDR2 SDRAM (W9751G6KB-25) • Flash ROM : 128MB NAND Flash (F59L1G81LA)	

Serial Interface (RS-232C)	• Flow Control
	  1) Xon/Xoff (S/W Control)
	  2) RTS/CTS (H/W Control)
	• Baud Rate : 9,600 / 19,200 / 38,400 / 57,600 /115,200 bps
	• Connector Type : DB9P(Female)	

USB Interface	• Version : V2.0 • Transfer Type : BULK • Speed : 480M bps, High-Speed • Power : Self-powered • Connector Type : USB B type	
Ethernet Interface	• Network : 10/100 Base-T, Auto Detection • Protocol : TCP, UDP, IP, ICMP, ARP • Flow Control : Hardware(RTS/CTS)	
Printing Method	• Direct thermal Printing	
Printing Speed	• Max 127mm/sec (Max 5 ips)	
Power Consumption	• Operation : Max. 230.5 W (100% duty) • Idle(Ready mode): 1.12 W	
AC/DC Adapter	• Input : AC100~240V 50/60Hz 1.5A • Output : DC24V, 2.5A	Peak Load : 13A
Environment Condition	• Operating Temperature : 0°C ~ 40°C • Storage Temperature : -20°C ~ 60°C • Operating Humidity : 10% ~ 80% RH • Storage Humidity : 10% ~ 90% RH	
Weight	• Approx. 3.0kg (with Packing)	
Dimensions(mm)	• 189(W) × 221(D) × 171(H)	

3-2-2 Function Specifications

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 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 True Type 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 another image buffer during 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.	

3-3 Thermal Printer Specifications

3-3-1 Printer Specifications

Item	Description	Remark
Model	• SRP-E770III (TPH : XR104-7096 - SHEC)	
Printing Method	• Direct Thermal Printing	
Resolution	• 203dpi (8dots/mm)	
Printing Direction	• Unidirectional with friction feed	
Printing Width	• Max 104mm (4.1inch)	
Printing Speed	• Max 127mm/sec (5ips)	

3-3-2 Character Specifications

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	• 10 resident expandable SLCS bitmap fonts • One resident scalable font for SLCS • 16 resident Expandable BPL-Z bitmap fonts • One resident scalable font for BPL-Z • 5 resident expandable BPL-E bitmap fonts • Unicode supported (UTF-8, UTF-16LE, UTF-16BE)	

3-3-3 Barcode Specifications

Item	Description		Remark
1D Barcodes	• Codabar • Code 11 • Code 128 • Code 39 • Code 93 • EAN-13 • EAN-8 • Industrial 2-of-5 • Interleaved 2-of-5 • Logmars	• MSI • Plessey • Postnet • GS1 DataBar (RSS-14) • Standard 2-of-5 • UPC/EAN extensions • UPC-A • UPC-E • IMB	
2D Barcodes	• Codablock • Code 49 • Data Matrix • MaxiCode	• QR Code • PDF417 • MicroPDF417 • Aztec • TLC 39	

3-3-4 Paper Specifications

Item	Description	Remark
Paper Type	Direct Thermal	
Paper Form	Gap, Black Mark, Continuous, Fan-Fold, Notch	
Paper Width	Liner : 38.1~106 ±0.5mm Label : 104 ±0.5mm	
Paper Roll Size	Max Φ130mm (5.1 in)	
Spool Inside Dia.	Φ25.4mm (1.0 in) ~ Φ38.1mm (1.5 in)	

3-3-5 Warranty and Environment Specifications

Item	Description	Remark
Life	• Head : 6 months or 25Km (whichever comes first)	
Printer Unit	• 15 months	
Environmental Temperature	• Operating : 0°C ~ 40°C • Storage : -20°C ~ 60°C	
Humidity	• Operating : 10% ~ 80% • Storage : 10% ~ 90%	No Condensation

3-3-6 TPH(Thermal Printer Head) Specifications

Item	Description	Remark
Head Element Structure	• 2 Heaters / Dot	
Number of Heat Element	• 832 Dots	
Heat Element Pitch	• 0.125 mm/dot, 8dots/mm (203 dpi)	
Print Width	• 104mm ±0.2mm	
Average Resistance	• 750Ω ± 3%	
Operating Temperature	• 5°C ~ 40°C(Max. -5°C ~ 50°C)	

3-3-7 Other Component Specifications

Item		Description		Remark
Paper Feed Motor		• Model : M42SP-6NK • Voltage : 24Vdc	• Type : BI-Polar • Resistance : 6Ω	
Cover Open Sensor		• Detector S/W : KFC-V-101(I) • Rating : DC 16V	• Contact Resistance : 50mΩ(Max) • Operating Force : 61gf (Max)	
Gap Sensor	Up	• InfraRed Emitting Diode (GaAs)	• Model : EL-23G	
	Down	• Reflection Type Photo Sensor	• Model : SG-112	
Peel Off Sensor		• Reflection Type Photo Sensor	• Model : SG-112	

3-4 SMPS Specifications

3-4-1 SMPS (Switching Mode Power Supply) Specifications

Item	Description	Remark
Input Voltage	Typical : 100V/240V AC Min : 100V AC Max : 264V AC	
Input Current	Max 1.5A, @100~240V AC Input	
Output Voltage	+24V ± 5% Initial Tolerance with no load	
Output Current	+24V ± 5%, 0~2.5A	
Inrush Current, Cold	100V AC : Max. 30A 240V AC : Max. 50A	
No Load Rated Voltage	Min. 22.80V, Std. 24.00V, Max. 25.20V	
Full Load Rated Voltage	Min. 22.80V, Std. 24.00V, Max. 25.20V	
Rated Current	2.5A, @100~240V AC Input	
Ripple and Noise	±250mV @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.C.P (Over Current Protection)	Min : 5.6A @ 110V AC Input Voltage	
O.V.P (Over Voltage Protect)	Max : 36V	
O.T. P (Over Temperature Protect)	140°C	
EFFICIENCY	Average 88% (Min.), per CEC method @115/230V(60/50Hz),25~100% load	

3-4-2 SMPS Output Connector

Pin Number	Signal Name
1	+24 VDC
2	GND(-)
3	N.C
Shell	GND(-)
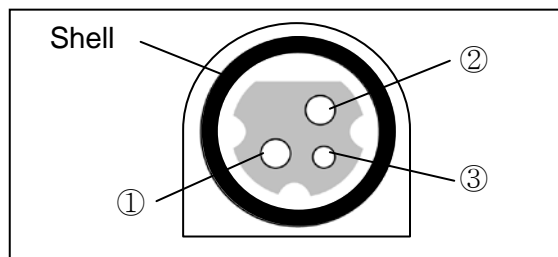
3-5 Interface Specifications

3-5-1 RS-232C Serial Interface

1) Specifications

Item	Description	Remark
Data Transmission	• Serial	
Synchronization	• Asynchronous	
HandShaking (Flow Control)	• H/W : RTS / CTS • S/W : Xon / Xoff	
Signal Level	• Logic 1(Mark) : 5V • Logic 0(Space): 0V	
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	• Odd , even or None	

2) RS-232C Cable

**Printer Side
D-SUB9P Male**

**Host Side
D-SUB9P Female**

3) Cable Connection

**Printer Side
D-SUB9P Male**

**Host Side
D-SUB9P Female**
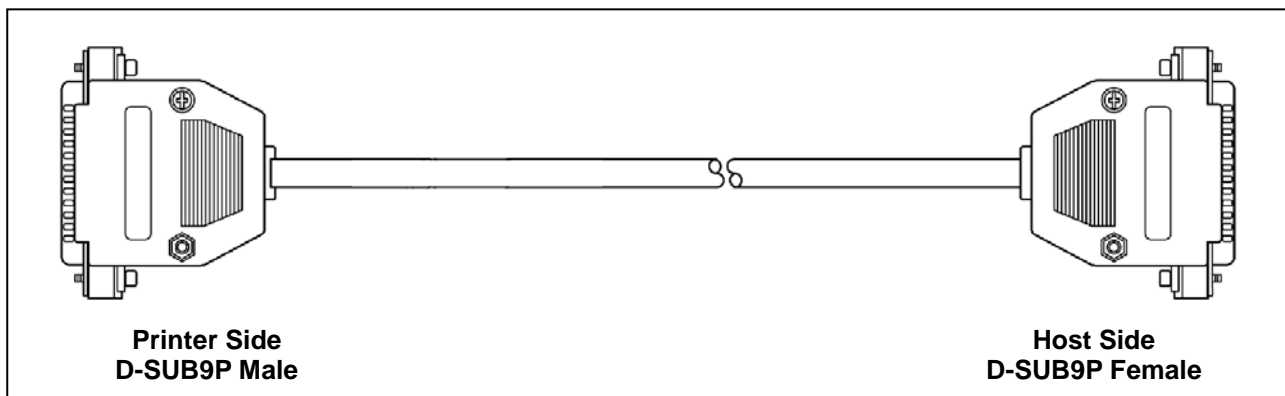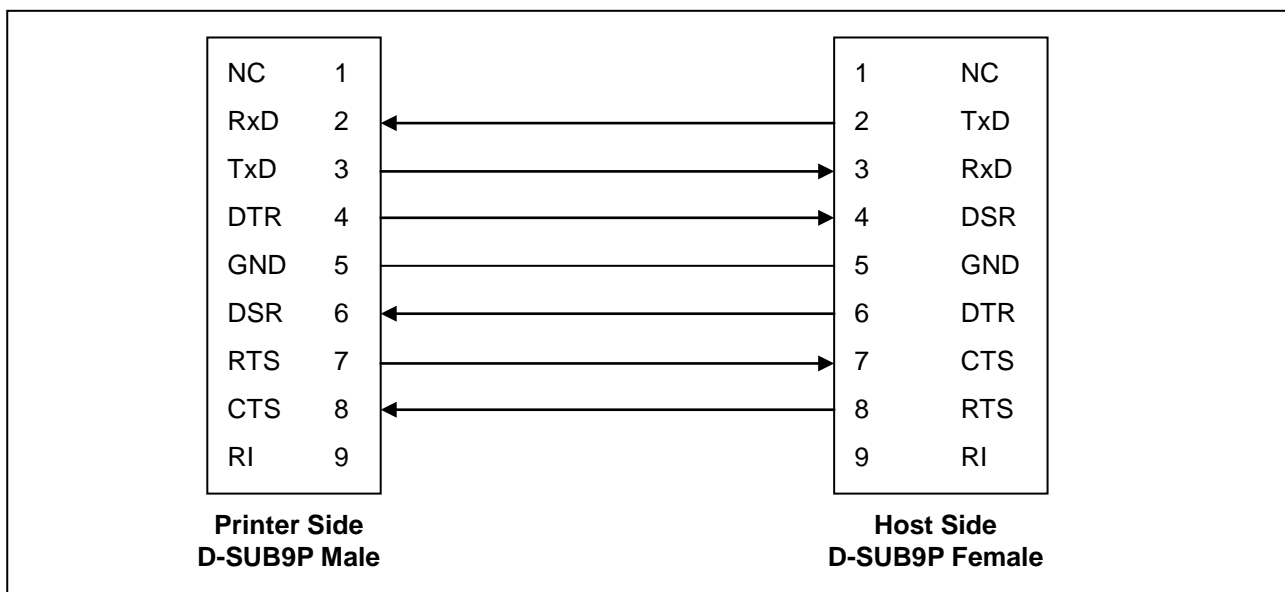
4) Signal Description

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
hrough 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.

3-5-2 Ethernet Interface

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
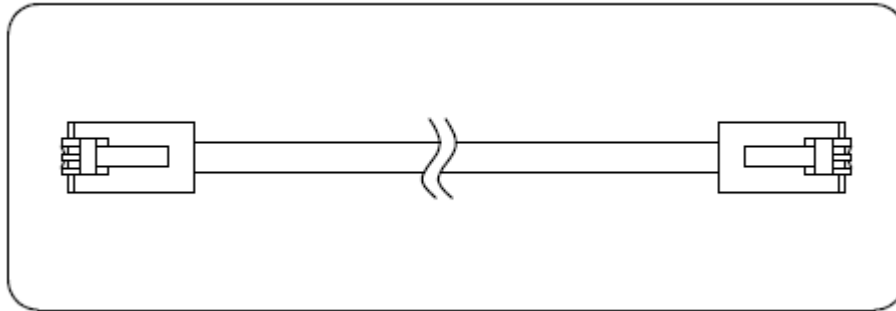
3) Ethernet I/F signal descriptions

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.

Ver. 1.01

3-5-3 USB interface

1) Specifications

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

Host Side
A Type

Printer Side
B Type
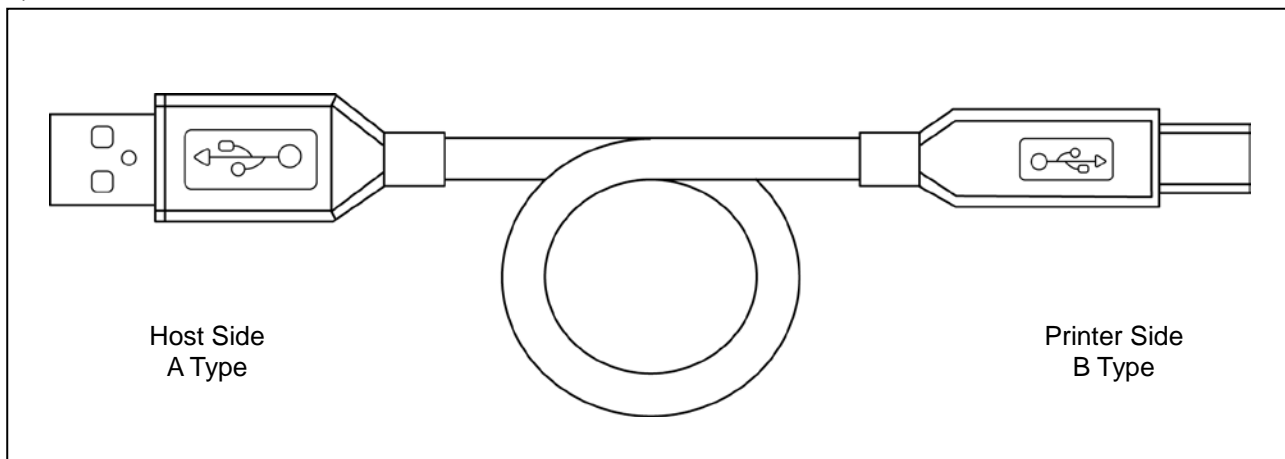
4. Hardware

4-1 Wiring Diagram

4-2 Block Diagram
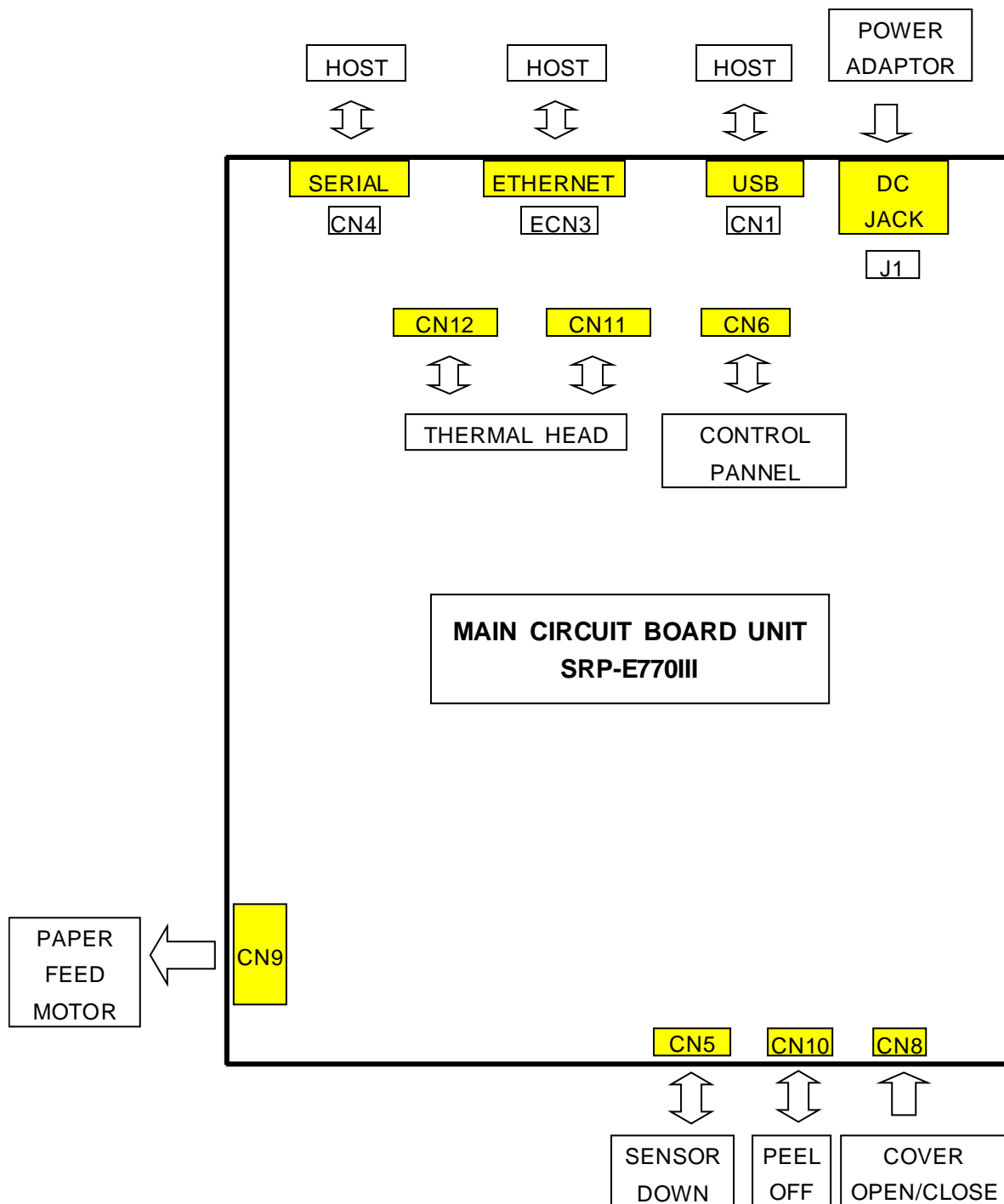
SRP-E770III BLOCK DIAGRAM
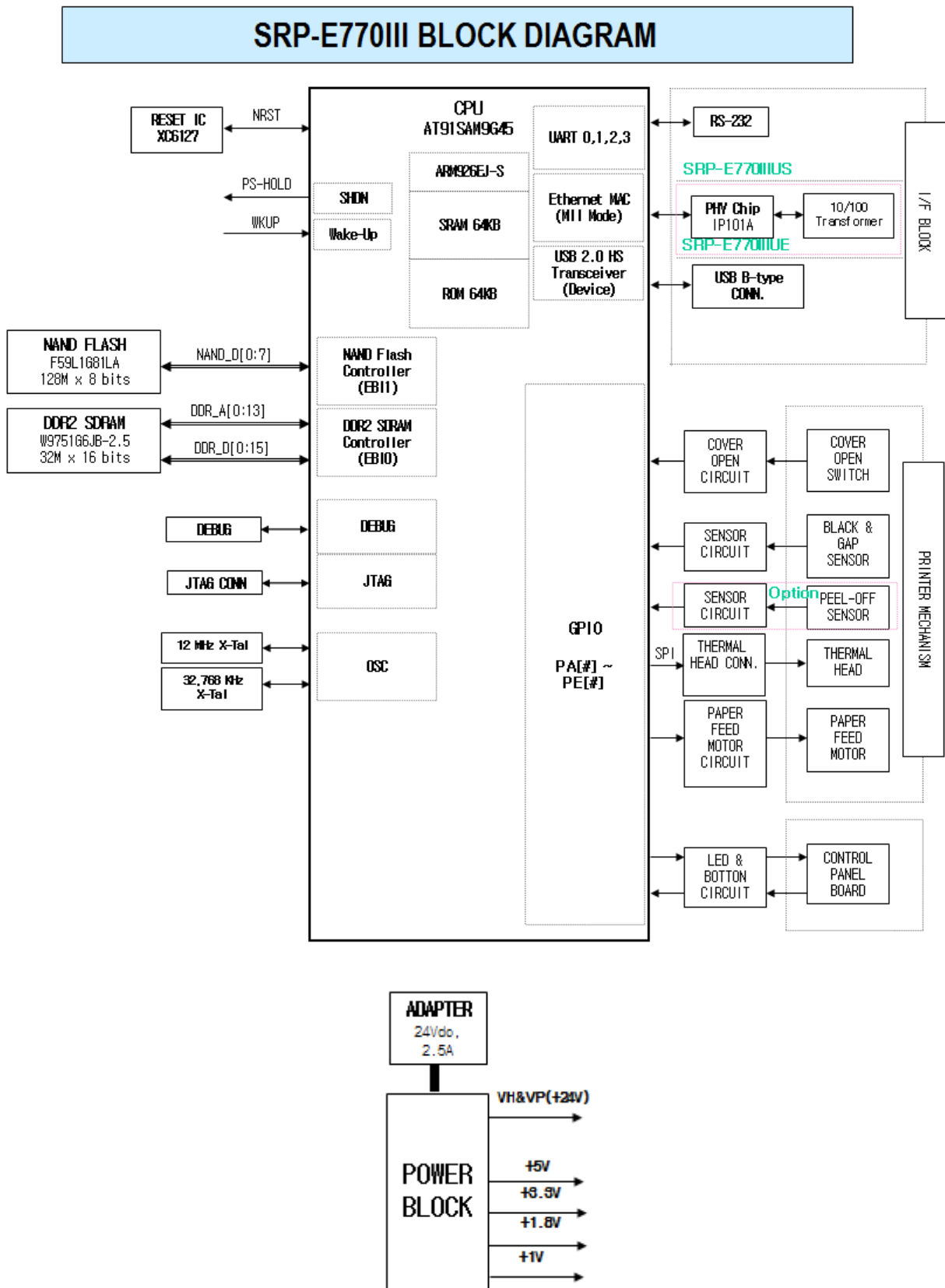
4-3 Special Circuit Description

4-3-1 Power Circuit

This system is operated under 100Vac or 240Vac. The power circuit supplies the three differential DC voltage sources.
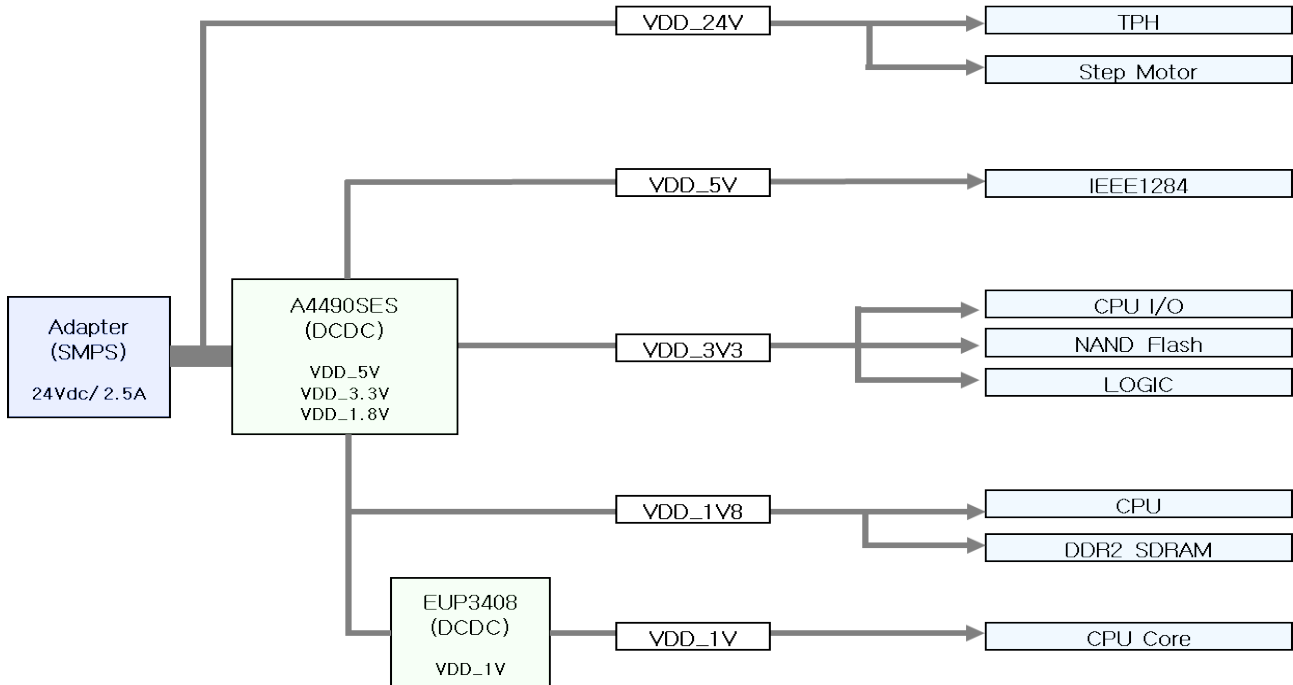
No.	VOLTAGE	DESCRIPTION
1	VDD_24V (+24VDC)	Step Motor Voltage, Thermal Printer Head (TPH) Voltage
2	VDD_3V3 (+3.3VDC)	CPU I/O, NAND Flash, LOGIC Etc. Voltage
3	VDD_1V8 (+1.8VDC)	CPU, DDR2 SDRAM Voltage
4	VDD_1V (+1VDC)	CPU Core Voltage

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

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

4) 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.
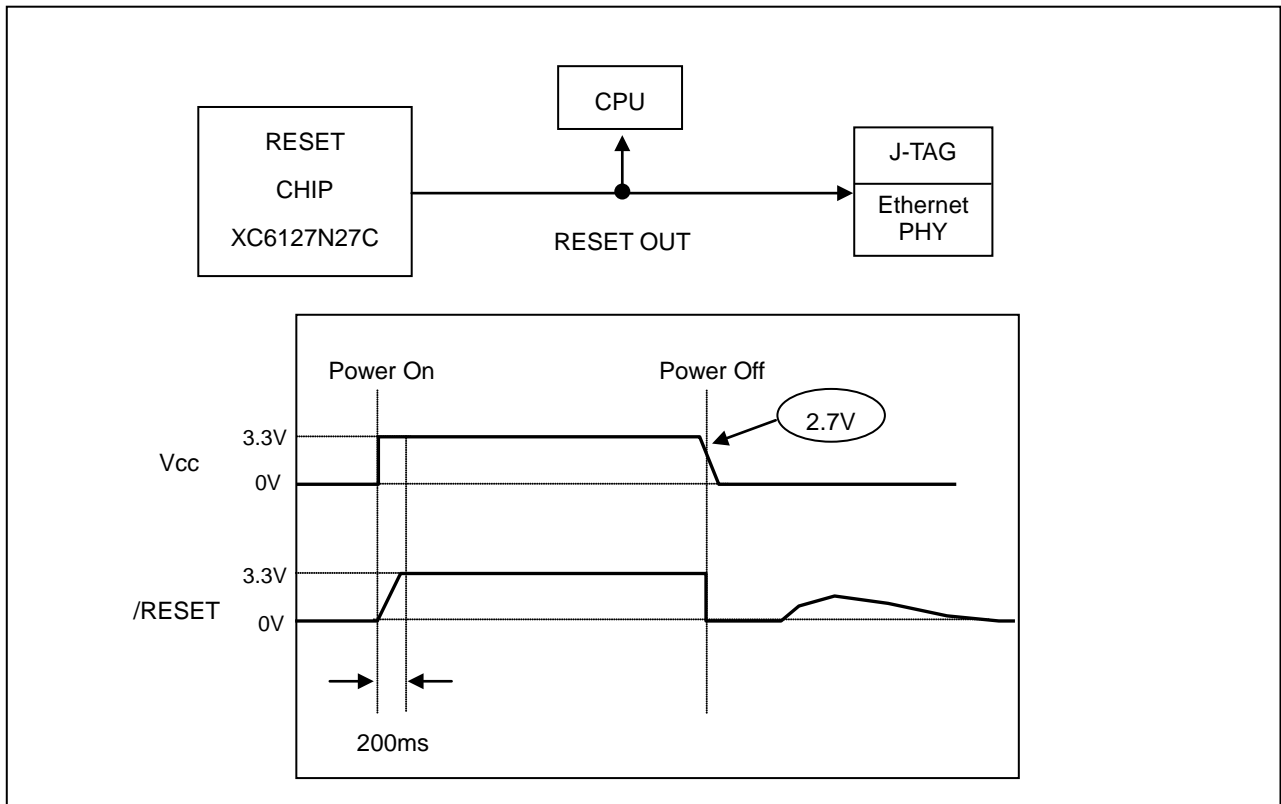
Figure 4-1 Reset Circuit

4-3-3 RS232C Communication Block Diagram

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

1) RS232C Communication block diagram
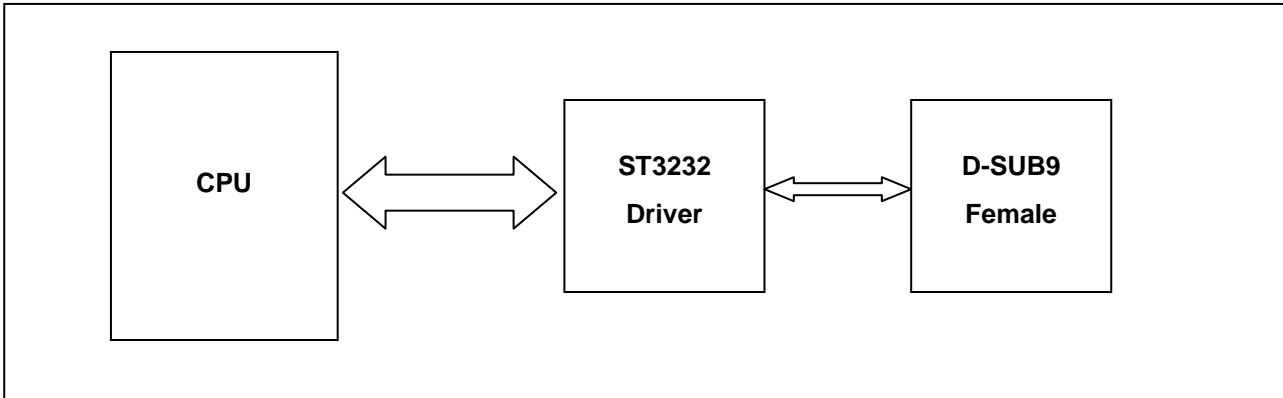
Figure 4-2 RS232C Communication Block

2) RS232C Communication waveform
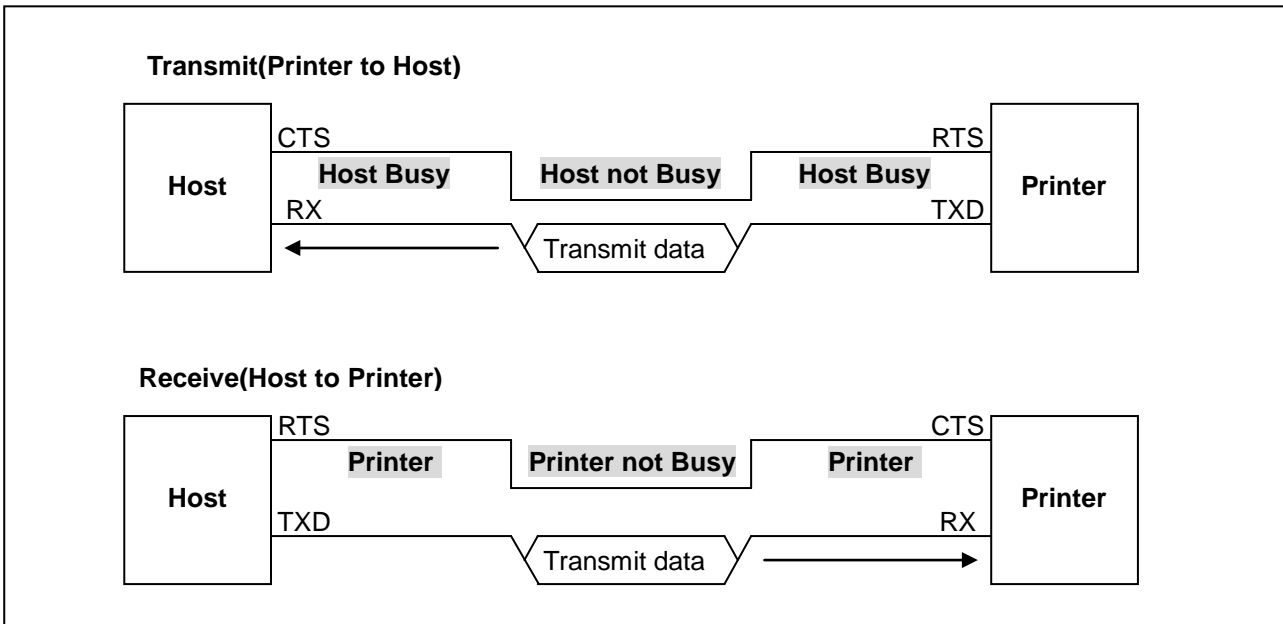
Figure 4-3 RS232C Communication Waveform

4-3-4 Ethernet Communication Block Diagram

The printer supports the Ethernet. The Network type is 10/100 Base-T All in one type. (Auto detection)
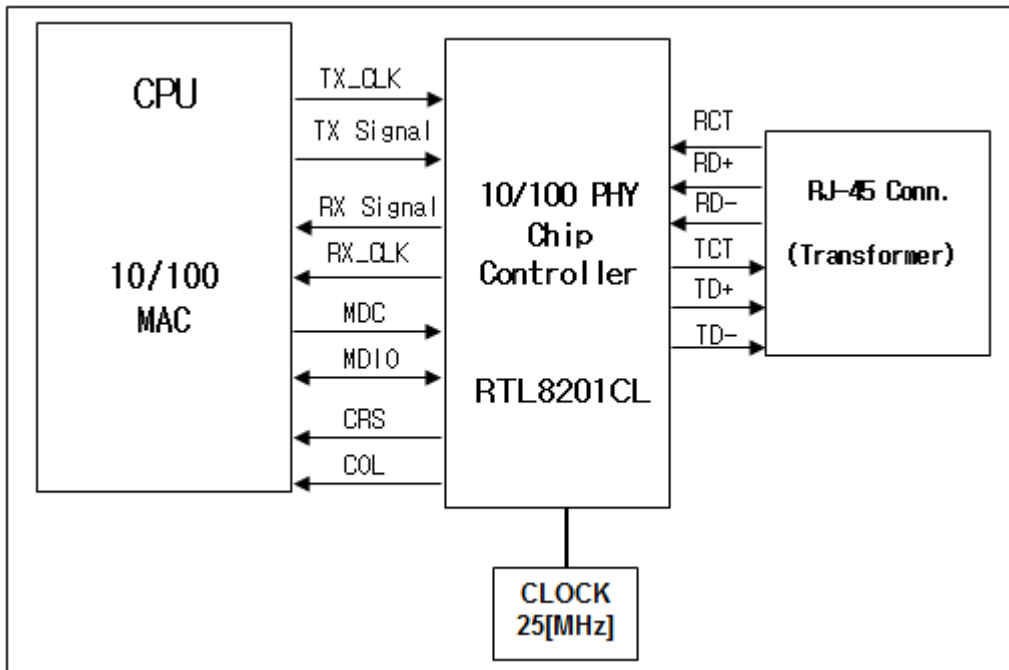
Figure 4-4 Ethernet Communication Block Diagram

4-3-5 USB Communication Block Diagram

The printer support the USB(Universal Serial Bus). The transfer type is the BULK.
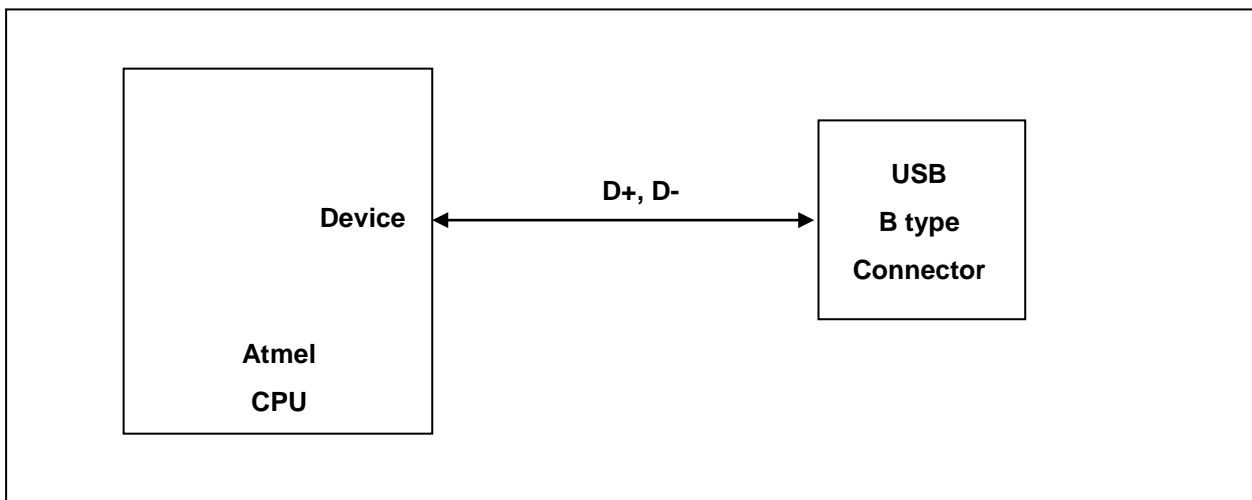
Figure 4-5 USB2.0 Communication Block Diagram

4-3-6 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 ~ 192	192	TPH_STB1
STB2	193 ~ 320	128	TPH_STB1
STB3	321 ~ 448	128	TPH_STB1
STB4	449 ~ 576	128	TPH_STB2
STB5	577 ~ 704	128	TPH_STB2
STB6	705 ~ 832	128	TPH_STB2
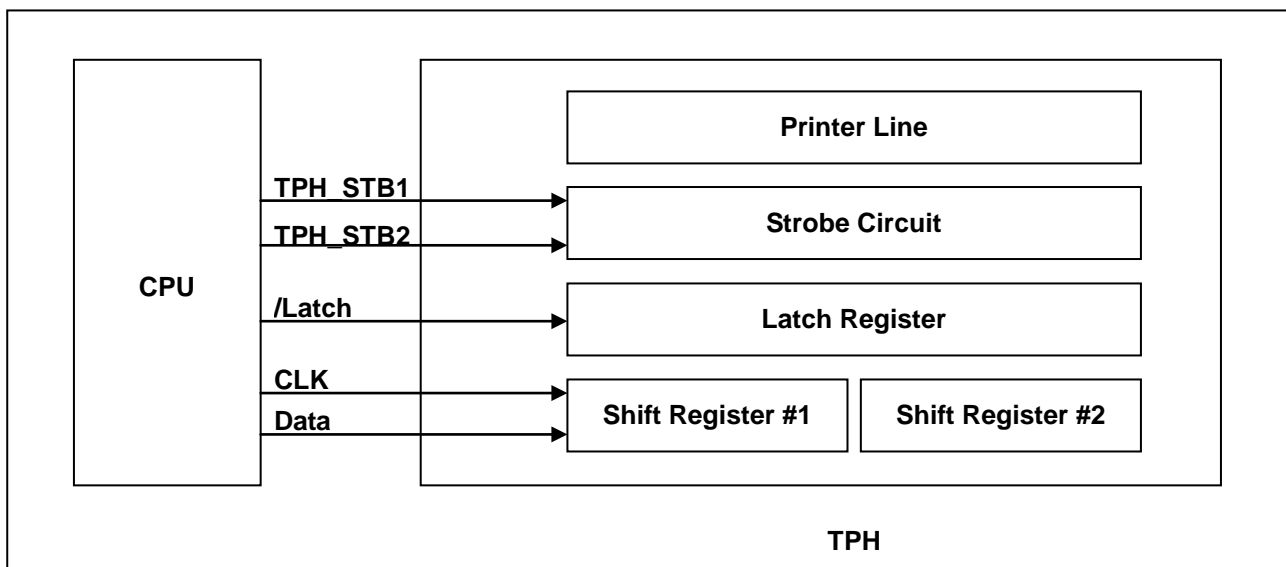
Figure 4-6 Thermal Printer Block Diagram
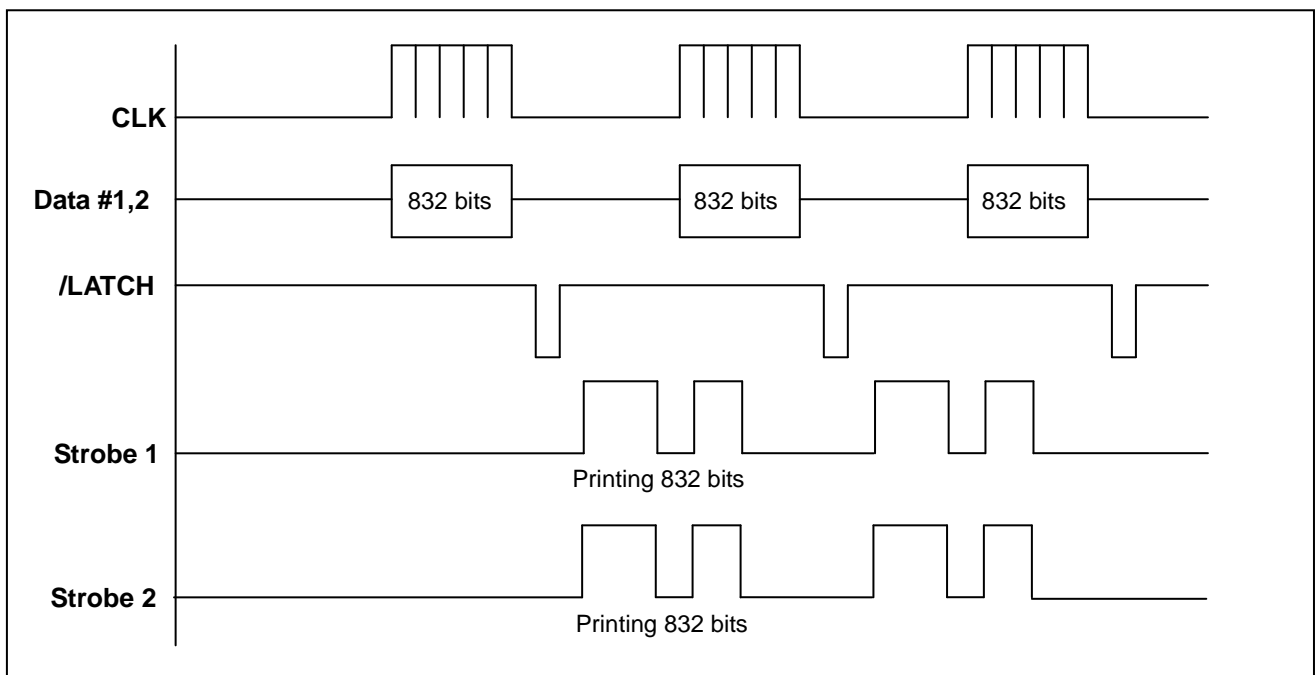
Figure 4-7 Thermal Printer Timing Waveform

5. Disassembly and Assembly

5-1 Case-Lower Block

5-1-1 Case Lower Block

1. Remove the five screws① ②.
2. Separate the ③~⑤ from the printer.
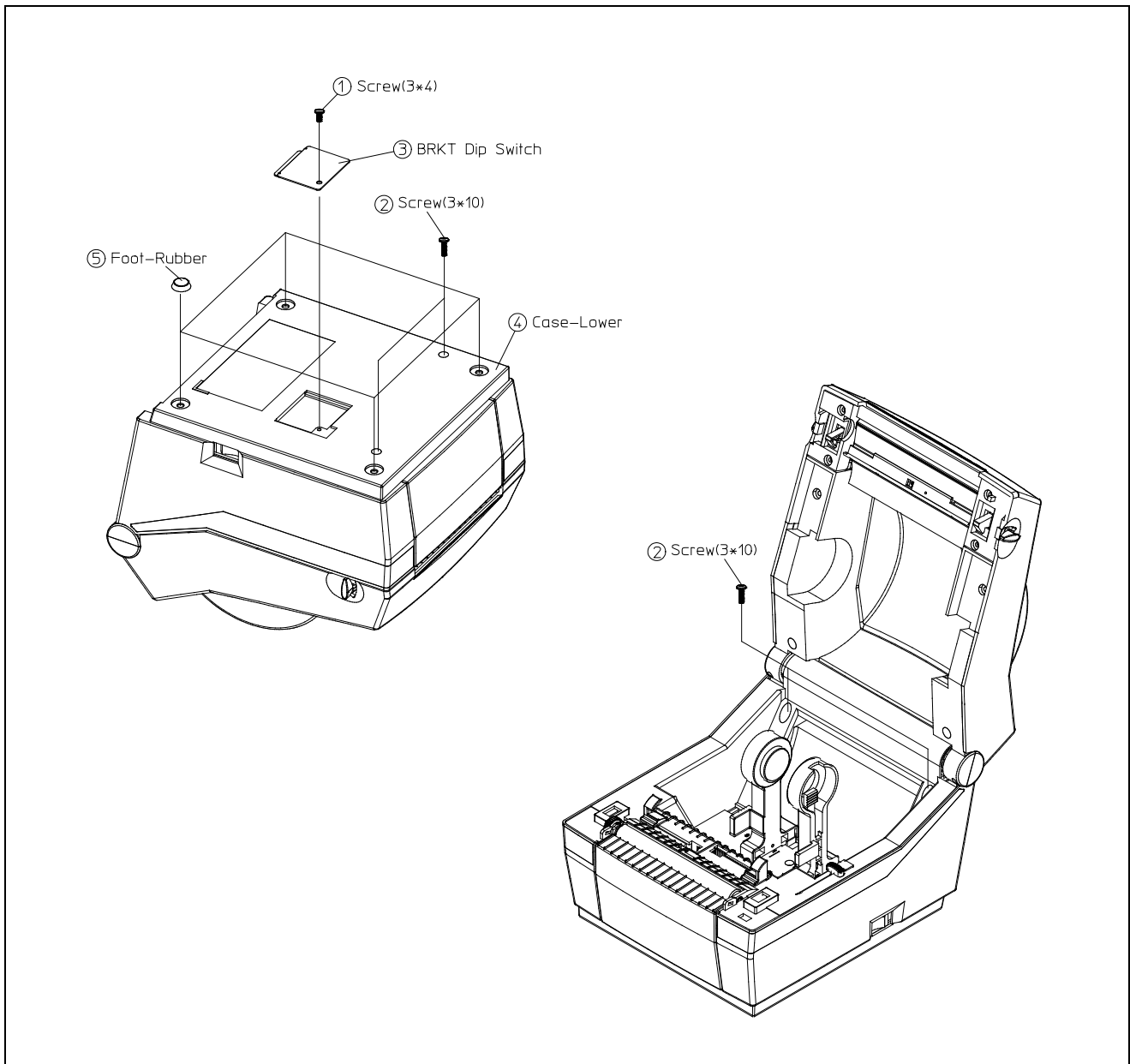
Figure 5-1 Disassembly Case-Lower #1

5-1-2 Main PCB Block

1. Remove the three Screws①.

2. Remove the connector wires④~⑨ from the PCB-Main②.

3. Separate the PCB Main② and sheet PCB③ from the Printer.

4. Remove the two Screws⑩.

4. Separte the Brkt-PCB⑪ from the PCB-Main②.
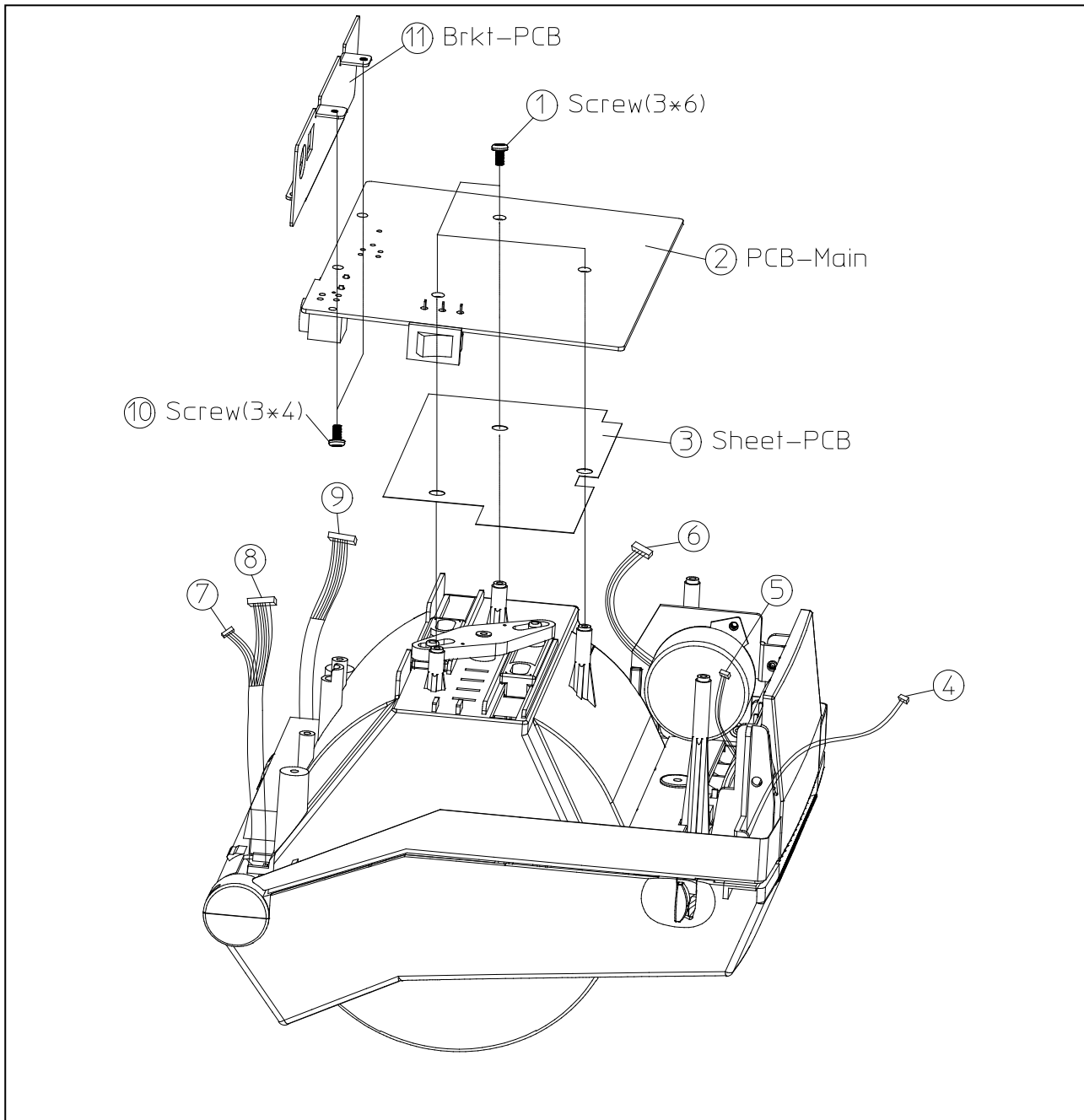
Figure 5-2 Disassembly Case-Lower #2

5-2 Lower Frame Block

5-2-1 Lower Frame Block

1. Move the Guide hinge①.

2. Separate the Lower-Frame Assembly② from the Case-Upper Assembly③.
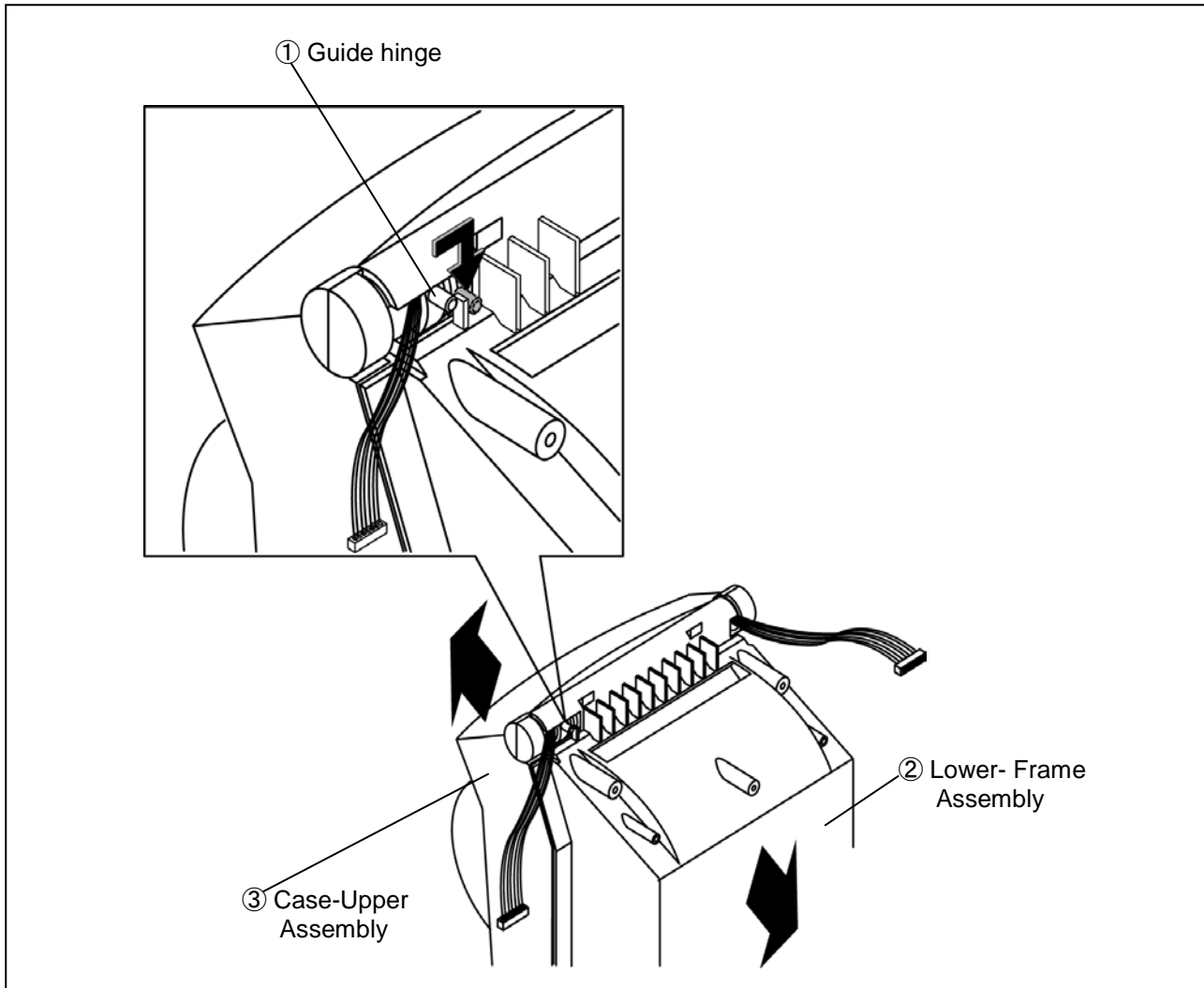
Figure 5-3 Disassembly Frame Lower #1

5-2-2 Cover STD Block

1. Separate the Guide hinge② and Spring hinge③ from the Frame-Lower①.
2. Separate the Cover-STD④ from the Frame-Lower①.
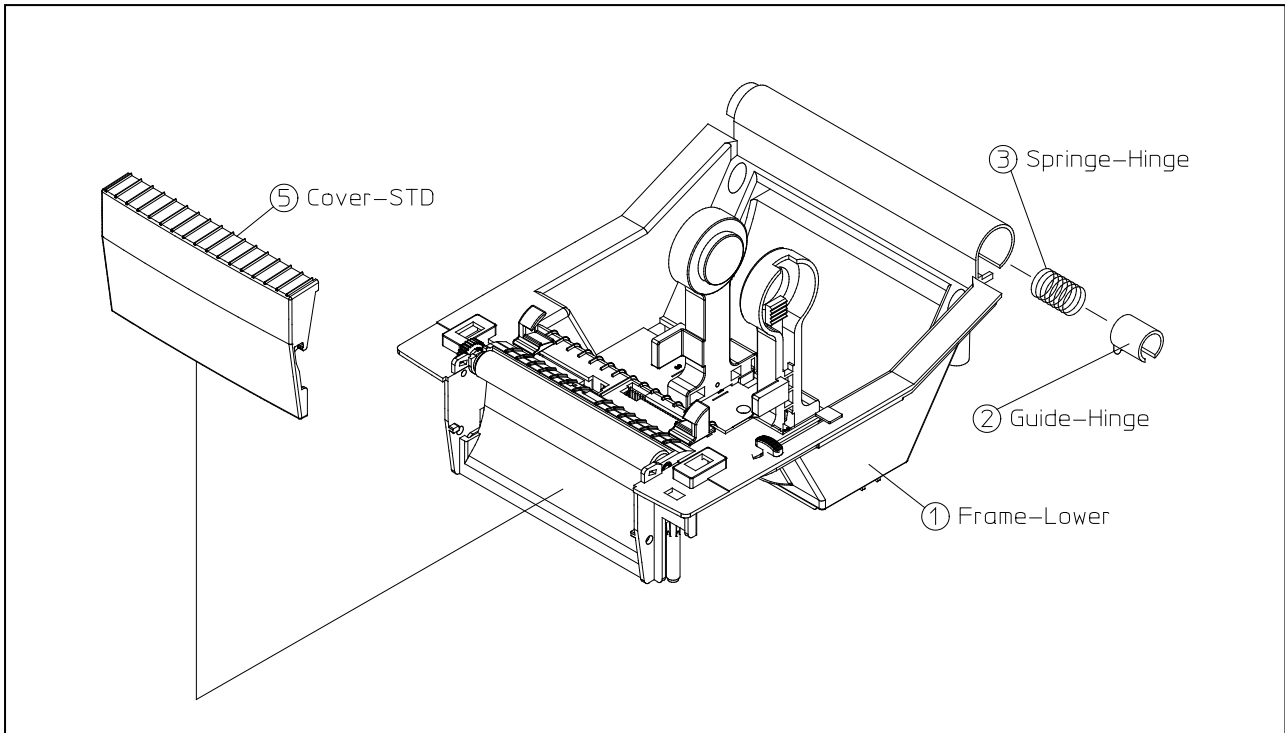
Figure 5-4 Disassembly Frame Lower #2

5-2-3 Motor Assembly Block

1. Remove the Screw②,③.
2. Separte the Assy Brkt Motor⑨ from the Frame-Lower①.
3. Remove the two screws⑦ and Separate the Motor⑧.
4. Remove the two Washer④ and Separate the ⑤, ⑥ form the Brkt Motor Assembly⑨.
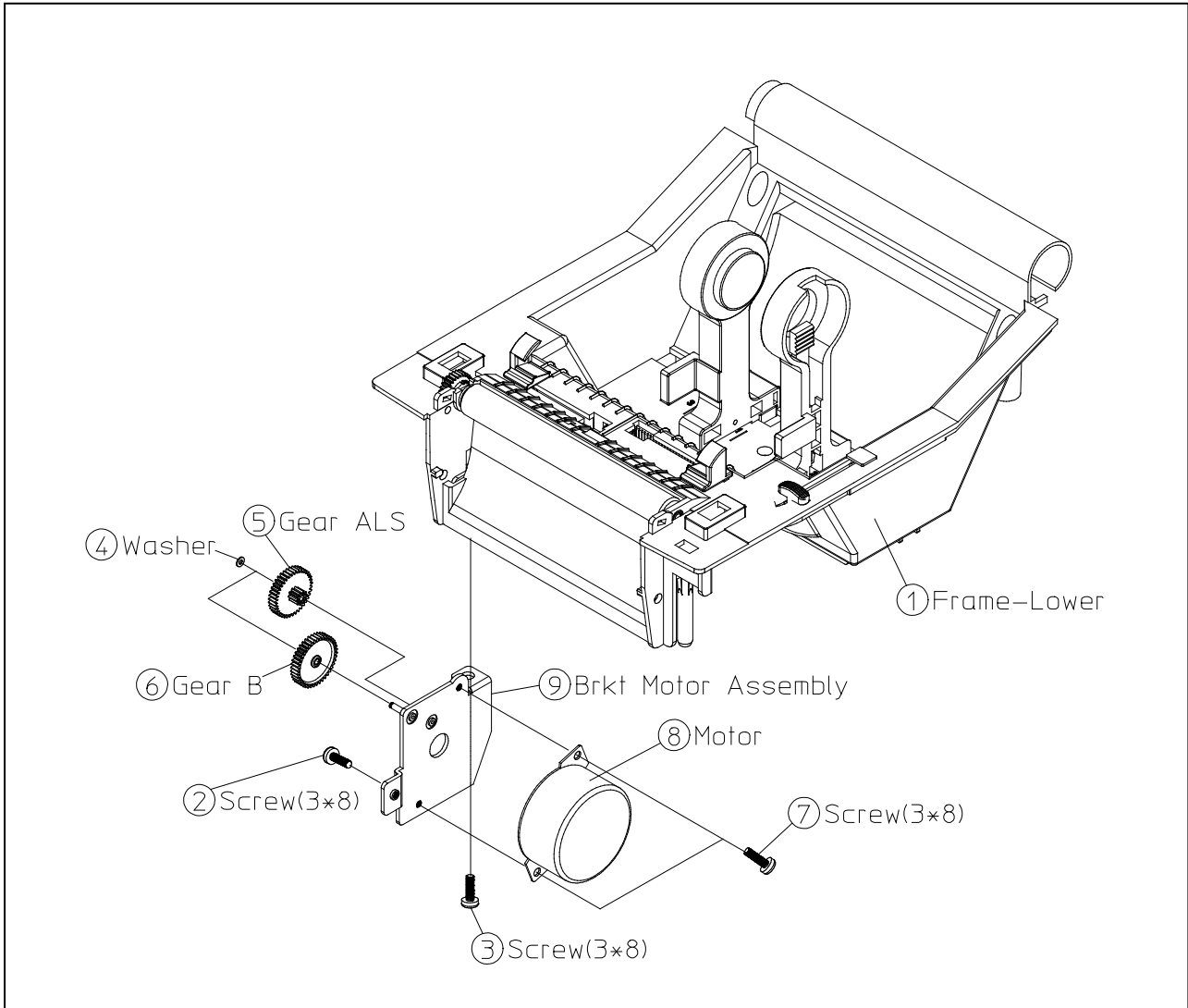
Figure 5-5 Disassembly Frame Lower #3

5-2-4 Platen Roller Block

1. Turn the Bush-Roller③.

2. Separate the ②~⑤ from the Frame-Lower①.
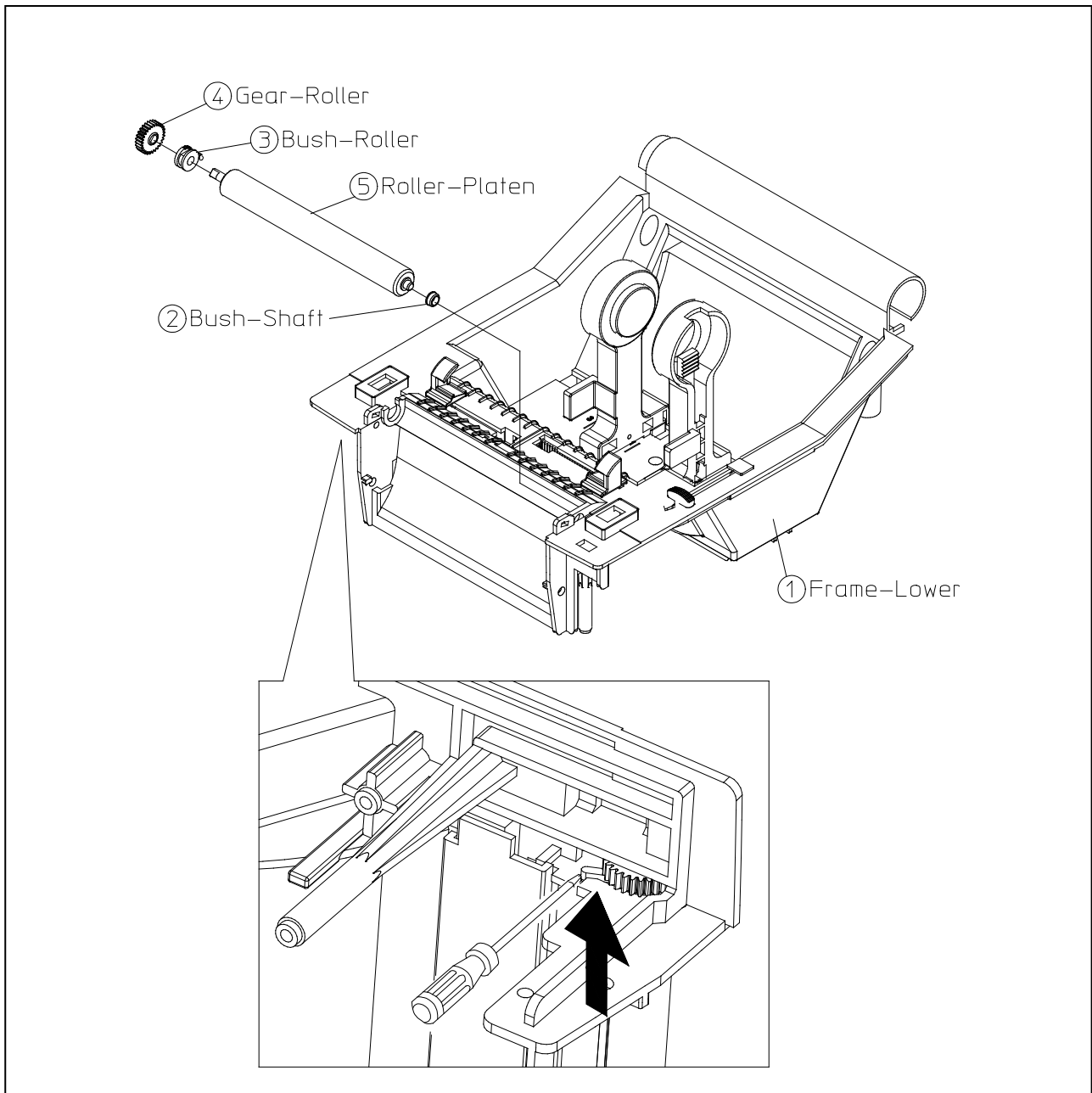
Figure 5-6 Disassembly Frame Lower #4

5-2-5 Paper Guide Block

1. Remove the two Screws②.

2. Separate the③~⑪ from the Frame-Lower①.

3. Remove the one Screw⑫ and the one Screw⑭.

4. Separate the⑬,⑮ from the Frame-Lower①.
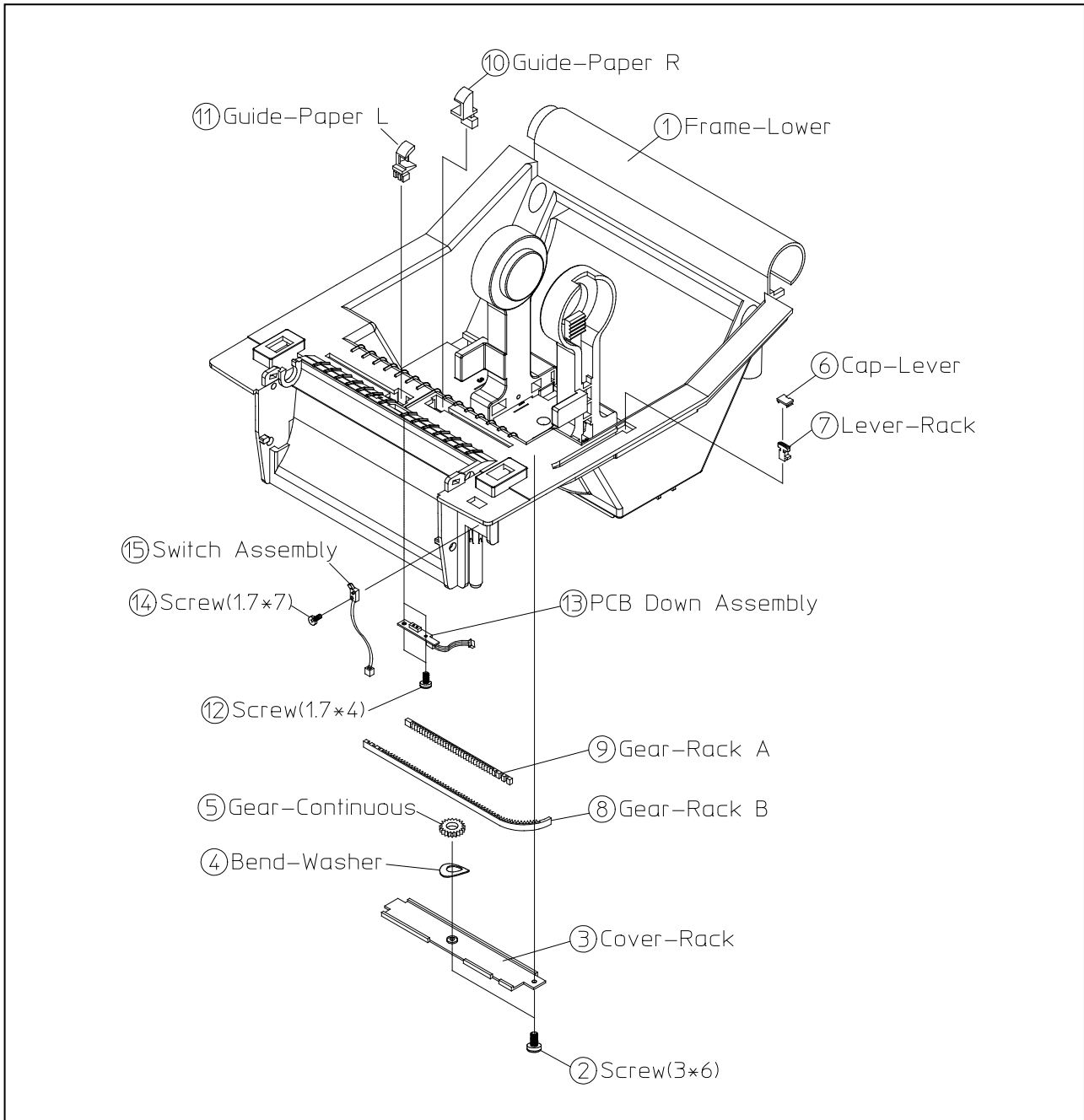
Figure 5-7 Disassembly Frame Lower #5

5-2-6 Paper Holder Block

1. Remove the one Screw② and four Screws③.

2. Separate the ④~⑧ from the Frame -Lower①.

3. Separate the Holder-Paper Fixed⑨ from the Holder-Paper R⑧.
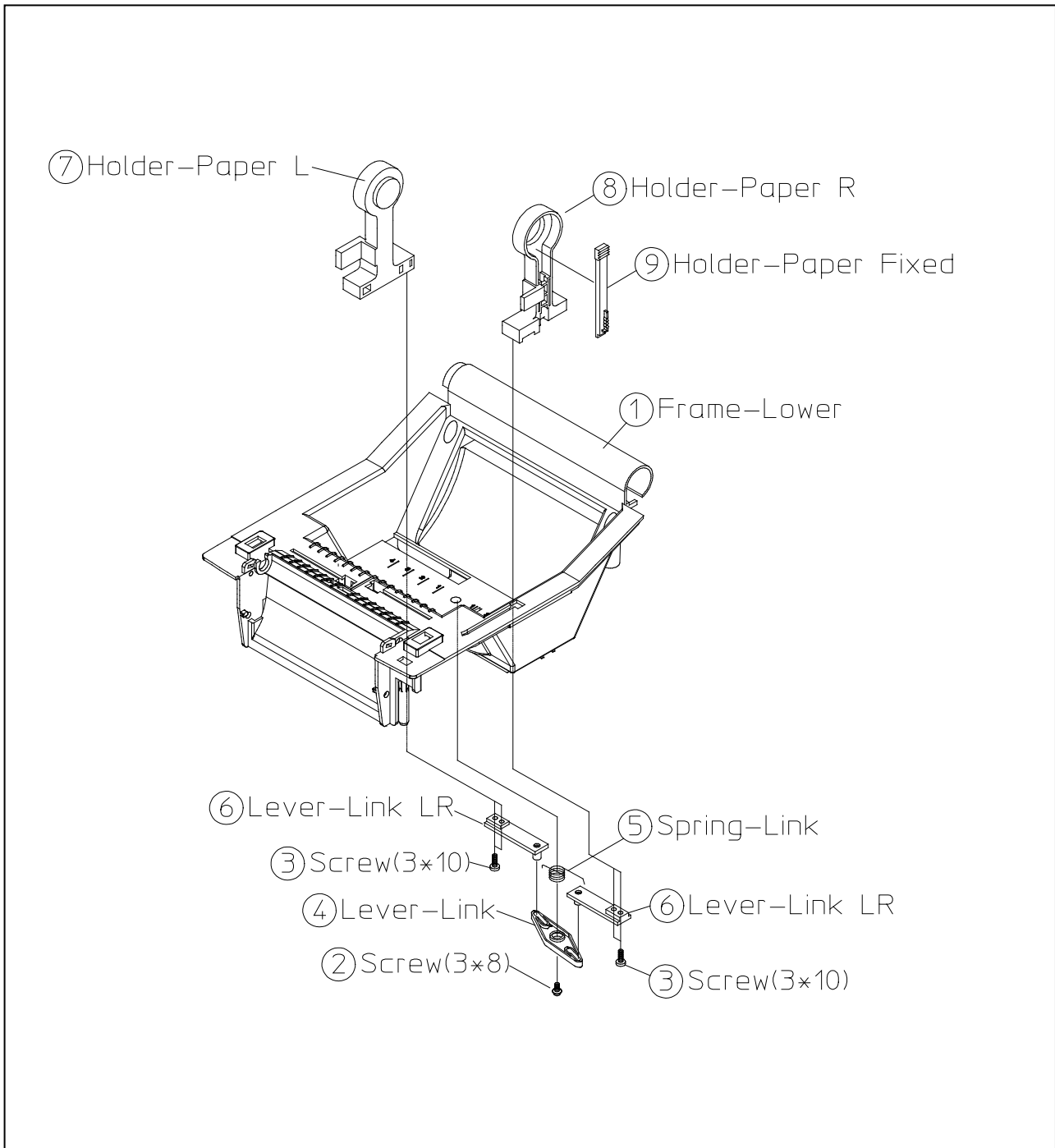
Figure 5-8 Disassembly Frame Lower #6

5-3 Case Upper Block

5-3-1 Case Upper Block

1. Remove the four Screws① and two Screw②.
2. Separate the ③~⑥ from the Case-Upper⑦.
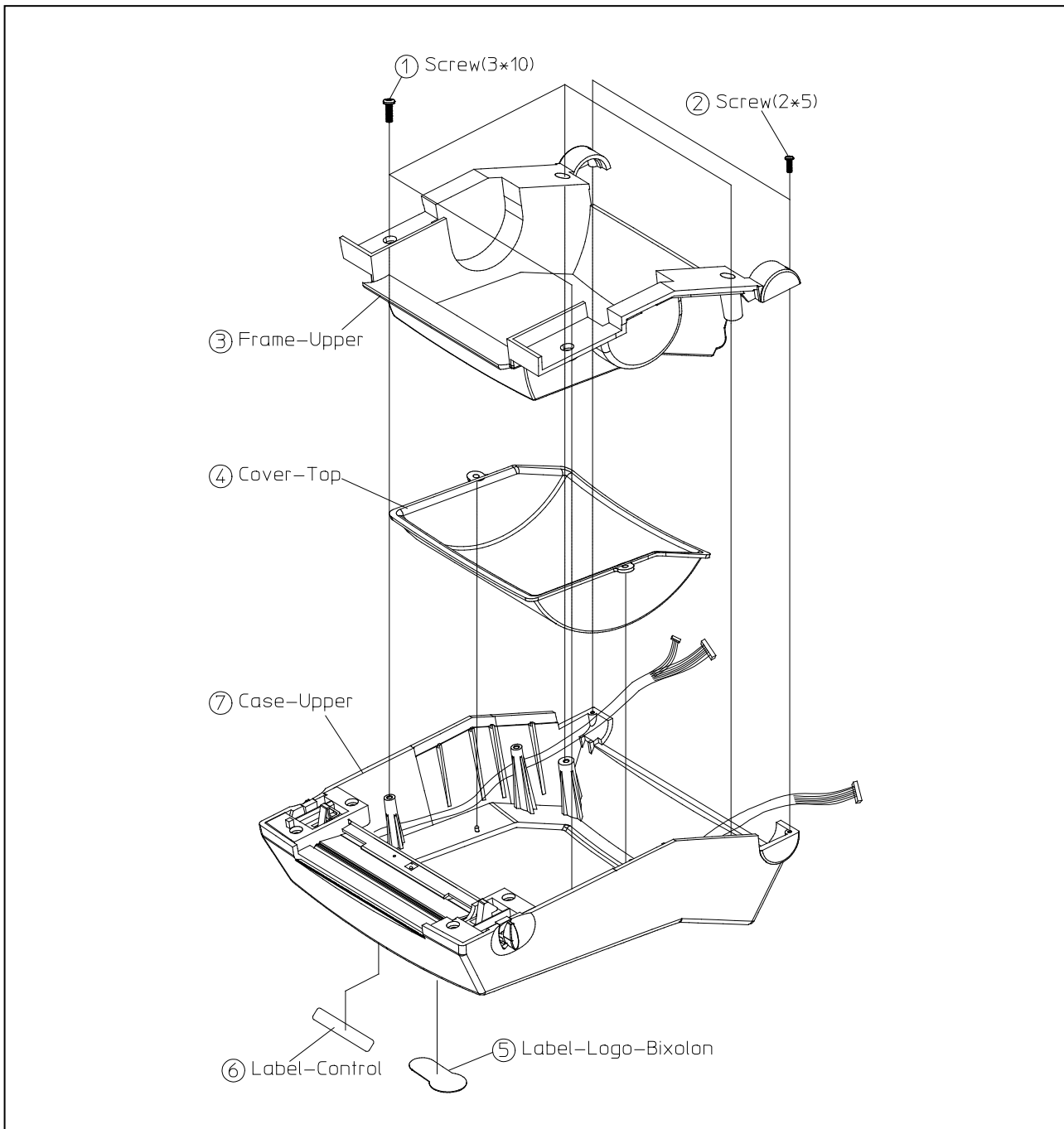
Figure 5-9 Disassembly Case Upper #1

5-3-2 Holder TPH Block

1. Remove the four Screws①.

2. Separate the Holder-TPH Assembly② from the Case-Upper③.
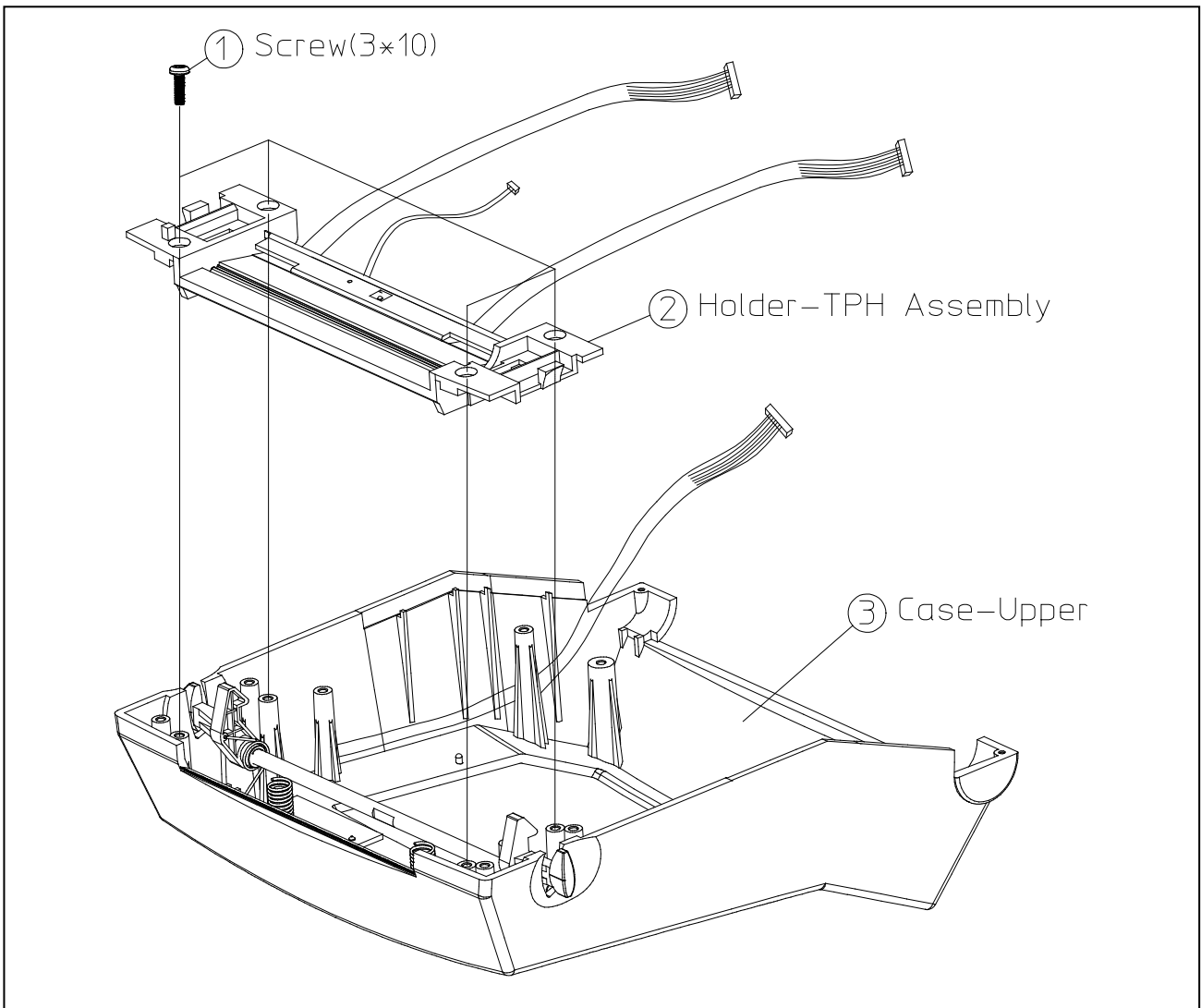
Figure 5-10 Disassembly Case Upper #2

5-3-3 TPH Assembly Block

1. Separate the TPH Assembly② from the Holder TPH①.

2. Remove the one Screw③ and separate the PCB Sensor-up④.

3. Separate the two Connectors Wire Head⑤ from the TPH⑥.

4. Remove the two Screws⑦.

5. Separate the Brkt TPH⑧ from the TPH⑥.
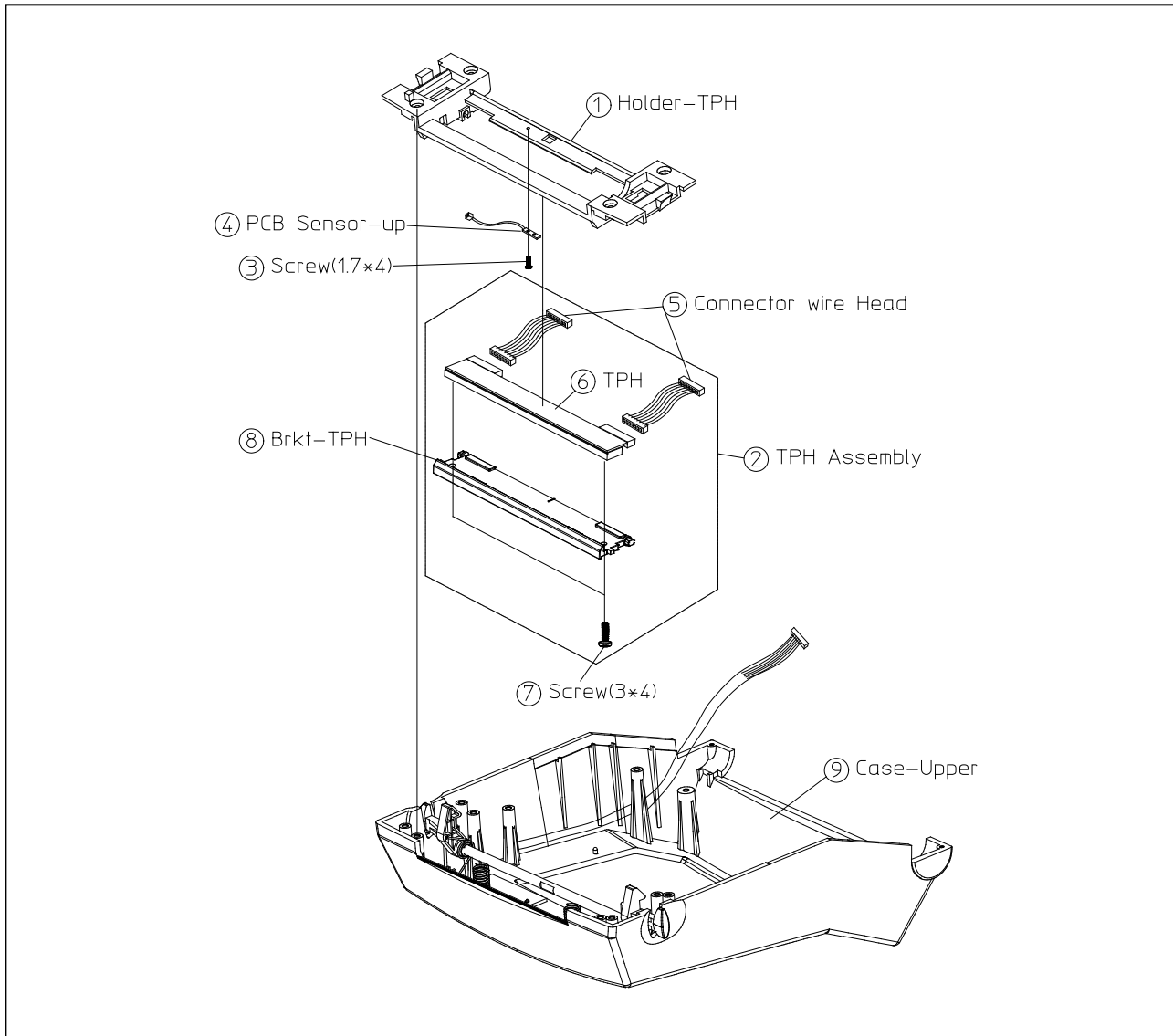
Figure 5-11 Disassembly Case Upper #3

5-3-4 Lever Lock Block

1. Lift the Lever-Lock Assembly① from the Case-Upper②.
2. Separate the two Spring-TPH③ from the Case-Upper②.
3. Remove the two Screws④.
4. Separate the PCB-Feed⑤ from the Case-Upper②.
5. Separate the Connector Wire Feed⑥ from the PCB-Feed⑤.

   * Disassembly Lever Lock Assembly

   1. Separate the Lever-Lock L⑦ / R⑧ from the Shaft-Lock⑪.
   2. Separate the Spring Lever Lock L⑨ / R⑩ from the Lever-Lock L⑦ / R⑧.
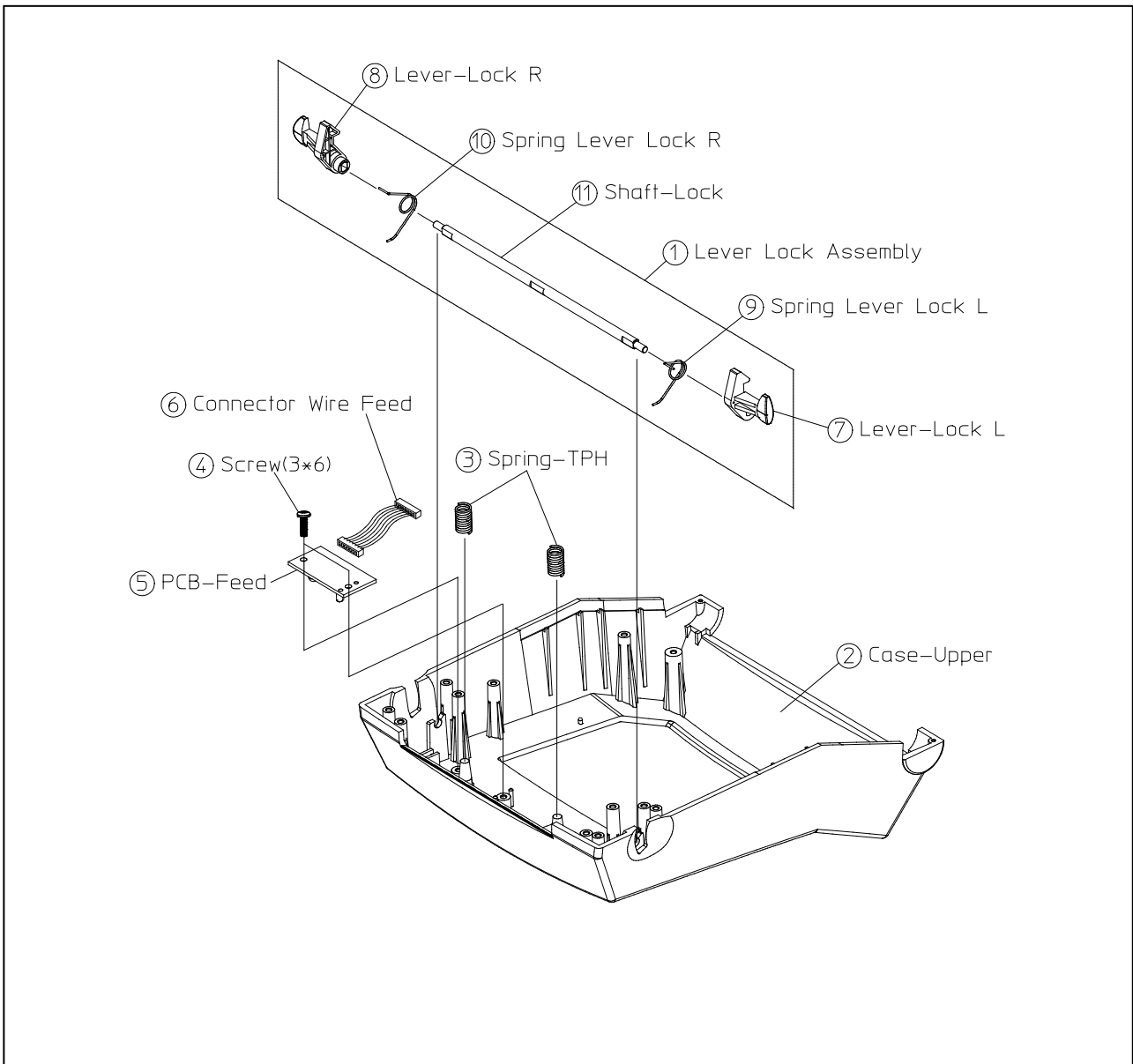
Figure 5-12 Disassembly Case Upper #4

6. Maintenance

6-1 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.
- Be careful not to get your fingers pinched when opening or closing the paper cover. Also be careful the paper cover does not slip off and drop.
- When loading roll paper, be careful not to get your fingers pinched between the paper roll and the supply unit.
- Do not touch the cutter with your hands. Doing so could result in an injury.

1) Open the Paper Cover 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.
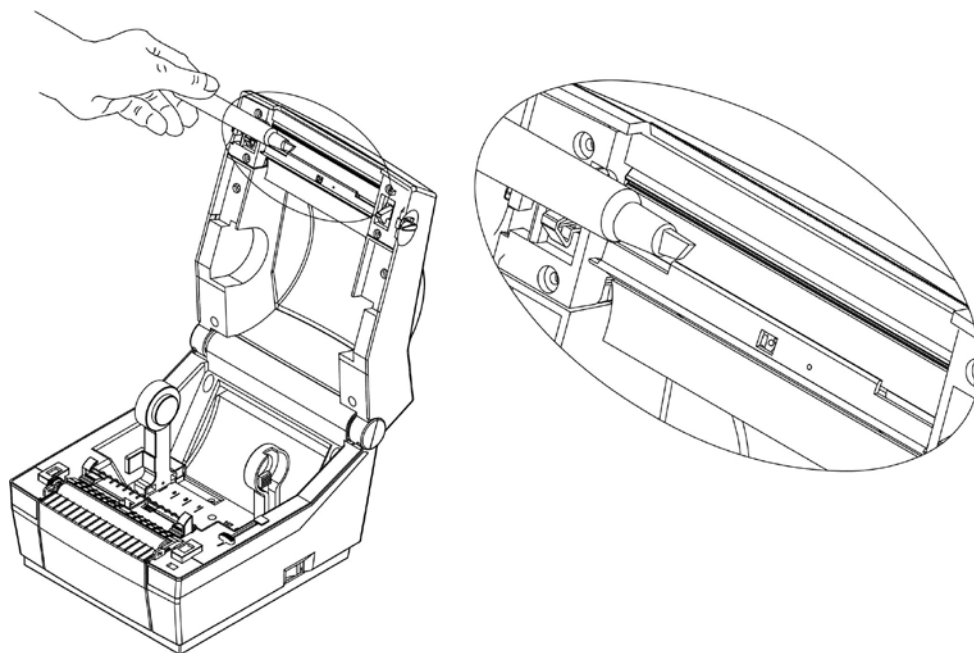
6-2 Cleaning Sensors, Roller or/and Paper Path

1) Open the Paper Cover and remove the paper.

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 cleaning 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.
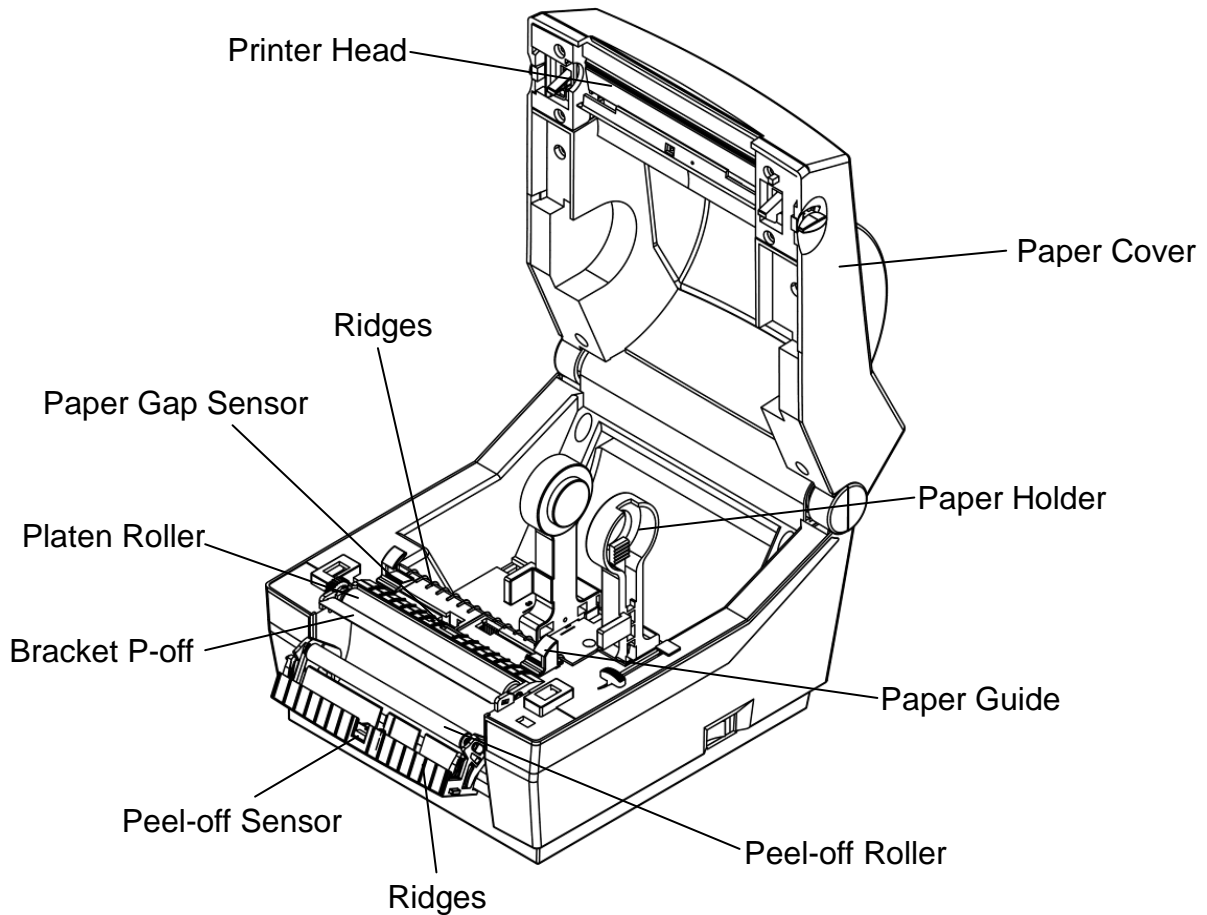
7. Troubleshooting

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 Troubleshooting flow chart

7-1-1 Basic 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.
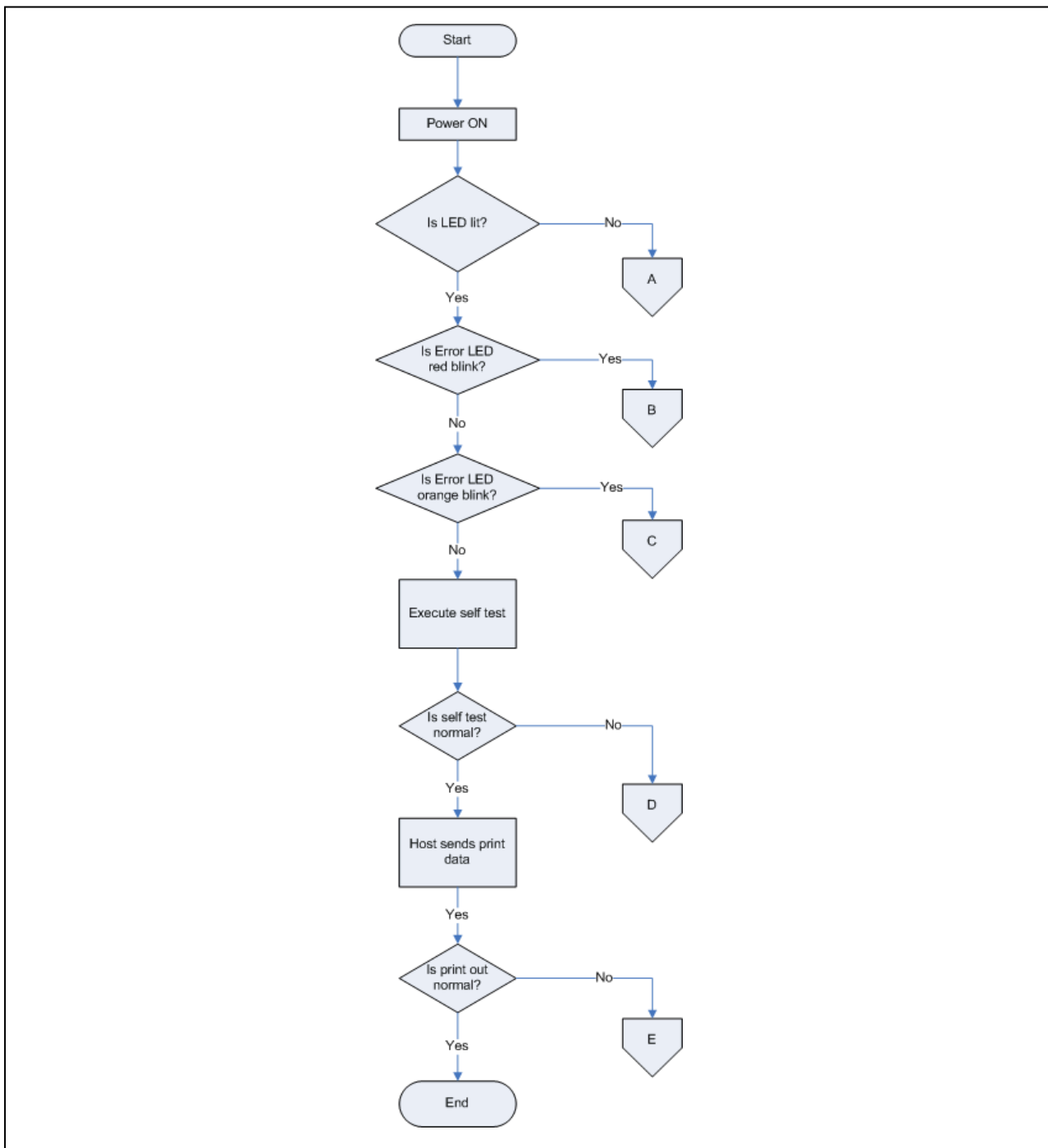
7-1-2 LED dose not light

7-1-3 LED is red blink

```
                              ┌─────┐
                              │  B  │
                              └──┬──┘
                                 │
                  ┌──────────────▼──────────────┐
                  │ Turn off the power, then turn│
                  │        on the power          │
                  └──────────────┬──────────────┘
                                 │
                              ◇ OK? ◇──────Yes──────►┌───────┐
                                 │                   │  END  │
                                 No                  └───────┘
                                 │
              ◇ Is label roll(paper) not insert? ◇──────No──────►┌──────────────────────────┐
                                 │                                │ Replace or insert        │
                                 Yes                              │ label(paper) roll        │
                                 │                                └────────────┬─────────────┘
                                 │                                             │
                                 │◄──────No──────◇ OK? ◇                        │
                                 │                  │                          │
                  ┌──────────────▼──────────────┐   Yes                        │
                  │ Replace up gap sensor(down)  │   │                          │
                  │        ass'y                 │ ┌──▼────┐                     │
                  └──────────────┬──────────────┘ │  END  │                     │
                                 │                └───────┘                     │
                              ◇ OK? ◇──────Yes──────►┌───────┐
                                 │                   │  END  │
                                 No                  └───────┘
                                 │
                  ┌──────────────▼──────────────┐
                  │ Replace up gap sensor(up)    │
                  │        ass'y                 │
                  └──────────────┬──────────────┘
                                 │
                              ◇ OK? ◇──────Yes──────►┌───────┐
                                 │                   │  END  │
                                 No                  └───────┘
                                 │
                  ┌──────────────▼──────────────┐
                  │ Replace PCB-main ass'y       │
                  └──────────────┬──────────────┘
                                 │
                              ┌──▼────┐
                              │  END  │
                              └───────┘
```

7-1-4 LED is orange blink

```
                              C

                  Turn off the power, then turn on the
                              power

                              OK? ──────── Yes ──────┐
                                                     │
                                                    END
                              No

                  Is cover opened? ──────── No ──────┐
                                                     │
                                                 Close cover

                  No  ◄──── No ──────  OK?
                                                     │
                                                    Yes

                  Replace cover s/w ass'y           END

                              OK? ──────── Yes ──────┐
                                                     │
                              No                    END

                  Replace PCB-main ass'y

                              END
```

7-1-5 Self test is not normal

```
                        ┌─────┐
                        │  D  │
                        └──┬──┘
                           │
            ┌──────────────┤
            │              │
    ╱─────────────────╲
   ╱ Does not printer   ╲──────Yes──────┐
   ╲ operate at all     ╱               │
    ╲─────────────────╱                 │
            │                   ╱─────────────────────╲
            │        Yes───────╱ Is output voltage of   ╲
            │                  ╲ regulator on PCB-main    ╱
            │                   ╲ within SPEC?(*1)        ╱
            │                    ╲─────────────────────╱
            │                             │
           No                            No
            │                             │
            │                  ┌───────────────────────┐
            │                  │ Replace PCB-main ass'y │
            │                  └───────────────────────┘
            │
    ╱─────────────────╲
   ╱ Does not paper     ╲──────Yes──────┐
   ╲ feeding?           ╱               │
    ╲─────────────────╱                 │
            │                  ┌───────────────────────┐
           No──────────────────│  Replace Motor ass'y  │
            │                  └───────────────────────┘
            │
    ╱─────────────────╲
   ╱ Dose print quality ╲──────Yes──────┐
   ╲ is deficient?      ╱               │
    ╲─────────────────╱                 │
            │                  ┌───────────────────────┐
           No──────────────────│  Replace TPH ass'y    │
            │                  └───────────────────────┘
    ╱─────────────╲
   ╱    OK?        ╲──────Yes──────┐
   ╲               ╱               │
    ╲─────────────╱             ┌──────┐
            │                   │ END  │
           No                   └──────┘
            │
  ┌───────────────────────┐
  │ Replace PCB-main ass'y │
  └───────────────────────┘
            │
         ┌──────┐
         │ END  │
         └──────┘
```

*1
VH: +24V
V_{TPH}: +24V
VCC: +3.3V
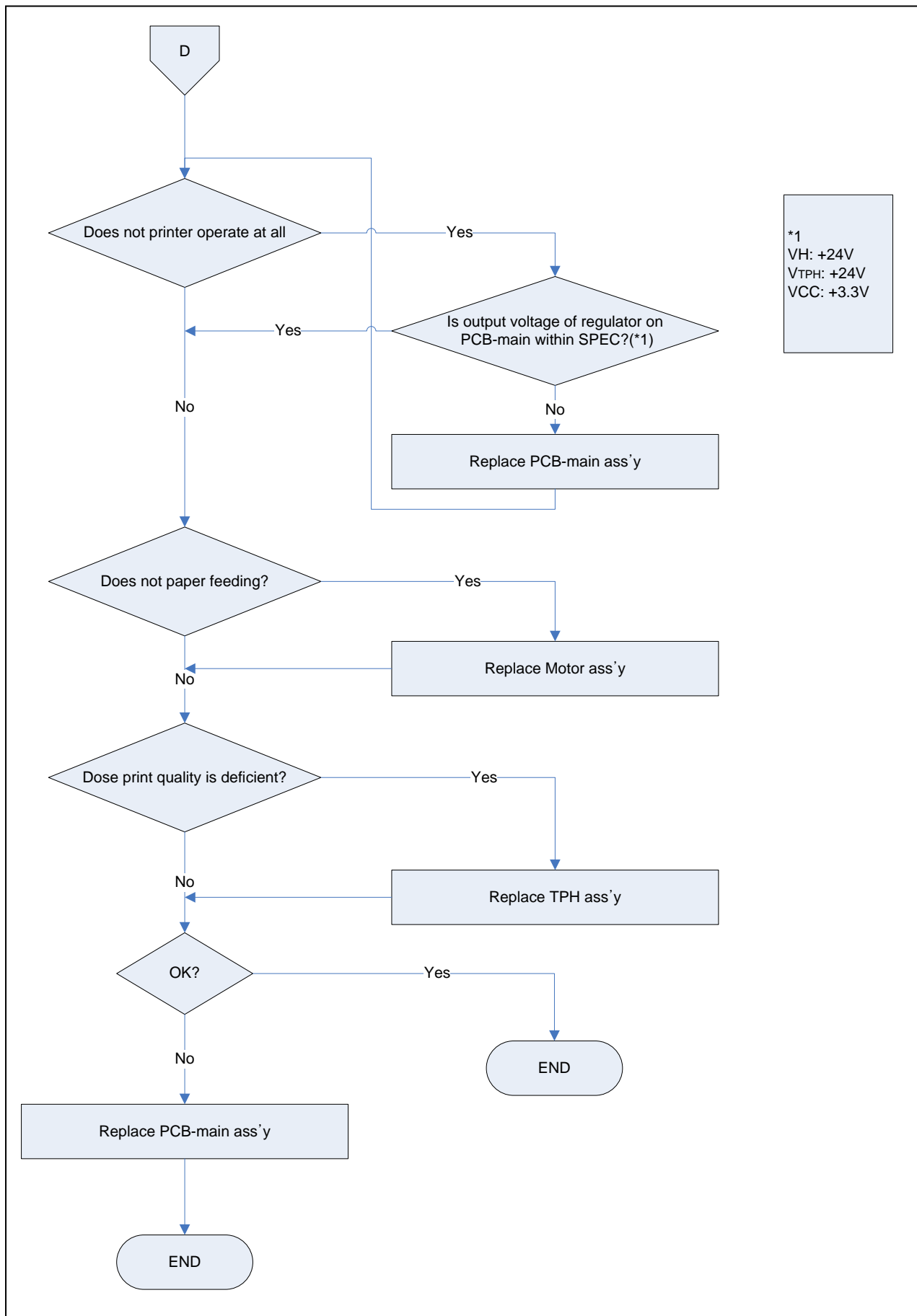
7-1-6 Data from host is not printed normal

```
                        ┌─────┐
                        │  E  │
                        └──┬──┘
                           │
                           ▼
          ┌──────────────────────────────────┐
          │ Turn off the power, then turn on  │
          │           the power               │
          └──────────────┬───────────────────┘
                         │
                         ▼
                      ◇ OK? ◇ ──── Yes ──────►  ( END )
                         │
                        No
                         ▼
          ┌──────────────────────────────────┐
          │   Send data from host to printer  │
          └──────────────┬───────────────────┘
                         │
                         ▼
                      ◇ OK? ◇ ──── Yes ──────►  ( END )
                         │
                        No
                         ▼
          ◇ Are interface parameter set
            to identical values at host and ── No ──► ┌──────────────────────┐
                     printer ◇                         │ Make settings identical│
                         │                             └──────────┬───────────┘
                        Yes                                       │
                         │                                        ▼
                         │         ◄─── No ─────────────────   ◇ OK? ◇
                         │                                        │
                         ▼                                       Yes
          ◇ Does interface cable match                            ▼
                 specification? ◇ ── No ──►              ( END )
                         │                    ┌──────────────────────┐
                        Yes                   │ Replace with a proper │
                         │                    │        cable          │
                         │                    └──────────┬───────────┘
                         │                               │
                         │        ◄─── No ─────────      ▼
                         │                            ◇ OK? ◇
                         ▼                               │
          ┌──────────────────────────┐                 ▼
          │   Replace PCB-main ass'y  │             ( END )
          └──────────────┬───────────┘
                         │
                         ▼
                      ◇ OK? ◇ ──── Yes ──────►  ( END )
                         │
                        No
                         ▼
          ┌──────────────────────────┐
          │      Check the host       │
          └──────────────────────────┘
```

7-2 Power Problem

```
              ┌─────────────┐
              │   Power     │
              │  Problem    │
              └──────┬──────┘
              ┌──────┴──────┐
              │ Turn on the power │
              └──────┬──────┘
                     │
          ◇ Power Out Ok? On SMPS ◇──No──┐
                     │ Yes               │
                     │          ┌────────┴────────────────┐
                     │          │ 1. Check the Input/Output Power Cable │
                     │          │ 2. Replace the Adapter(SMPS)          │
                     │          └─────────────────────────┘
          ◇ Power +24VDC Ok? (TP74) ◇──No──┐
                     │ Yes                  │
                     │        ┌─────────────┴──────────────┐
                     │        │ 1. Check the Power JACK (J1)        │
                     │        │ 2. Check the Fuse (FC1)             │
                     │        │ 3. Check the FET (Q14 & Q16)        │
                     │        │ 4. Check the related Circuit & Pattern │
                     │        └────────────────────────────┘
          ◇ Power TPH_24V Ok? (TP58) ◇──No──┐
                     │ Yes                   │
                     │      ┌────────────────┴───────────────┐
                     │      │ 1. Check the On/Off Signal on CPU    │
                     │      │   (TPH_VP_ON_OFF_CTL)                │
                     │      │ 2. Check the FET (Q12 & Q15)         │
                     │      └────────────────────────────────┘
          ◇ Power VDD_5V Ok? (TP47) ◇──No──┐
                     │ Yes                  │
                     │        ┌─────────────┴──────────────┐
                     │        │ 1. Check the IC (A4490EESTR_T, U7) │
                     │        │ 2. Check the related Circuit & Pattern │
                     │        └────────────────────────────┘
          ◇ Power VDD_3.3V Ok? (TP48) ◇──No──┐
                     │ Yes                    │
                     │        ┌───────────────┴────────────┐
                     │        │ 1. Check the IC (A4490EESTR_T, U7) │
                     │        │ 2. Check the related Circuit & Pattern │
                     │        └────────────────────────────┘
          ◇ Power VDD_1.8V Ok? (TP49) ◇──No──┐
                     │ Yes                    │
                     │        ┌───────────────┴────────────┐
                     │        │ 1. Check the IC (A4490EESTR_T, U7) │
                     │        │ 2. Check the related Circuit & Pattern │
                     │        └────────────────────────────┘
          ◇ Power VDD_1V Ok? (TP51) ◇──No──┐
                     │ Yes                  │
                     │        ┌─────────────┴──────────────┐
                     │        │ 1. Check the IC (EUP3408, U13)     │
                     │        │ 2. Check the related Circuit & Pattern │
                     │        └────────────────────────────┘
              ┌──────┴──────┐
              │     END     │
              └─────────────┘
```

7-3 System Problem

```
                    ┌─────────────────┐
                    │     System      │
                    │     Problem     │
                    └─────────────────┘
                             │
                    ┌─────────────────┐
                    │ Turn on the power│
                    └─────────────────┘
                             │
                    ◇ Reset Signal Ok? ◇ ─────── No ───────┐
                             │                              │
                            Yes                             ▼
                             │            ┌────────────────────────────────────┐
                             │◄───────────│ 1. Check the IC (XC6127N, U24)      │
                             │            │ 2. Check the related Circuit &      │
                             │            │    Pattern on PCB                   │
                             │            └────────────────────────────────────┘
                    ◇ Clock Signal Ok? ◇ ─────── No ───────┐
                             │                              │
                            Yes                             ▼
                             │            ┌────────────────────────────────────┐
                             │◄───────────│ 1. Check the Clock Xin, Xout        │
                             │            │ 2. Check the Frequency (12MHz, X2)  │
                             │            │ 3. Check the related Circuit &      │
                             │            │    Pattern on PCB                   │
                             │            └────────────────────────────────────┘
                    ◇ NAND FLASH Ok? ◇ ─────── No ───────┐
                             │                              │
                            Yes                             ▼
                             │            ┌────────────────────────────────────┐
                             │◄───────────│ 1. Check Data Line Pattern          │
                             │            │ 2. Check the related Circuit &      │
                             │            │    Pattern on PCB                   │
                             │            │ 3. Program download again           │
                             │            └────────────────────────────────────┘
                    ◇ DDR2 SDRAM Ok? ◇ ─────── No ───────┐
                             │                              │
                            Yes                             ▼
                             │            ┌────────────────────────────────────┐
                             │◄───────────│ 1. Check the DDR_CKE, DDR_CLK(NCLK),│
                             │            │    DDR_CS, DDR_WE Etc Signal        │
                             │            │ 2. Check Data Line Pattern          │
                             │            │ 3. Check the Address/Data Pattern   │
                             │            └────────────────────────────────────┘
                    ◇ CPU Ok? ◇ ─────── No ───────┐
                             │                      │
                            Yes                     ▼
                             │    ┌────────────────────────────────────┐
                             │◄───│ 1. Check the BOOT Select Part       │
                             │    │    (R211=1Kohm)                     │
                             │    │ 2. Check the Address/Data Pattern   │
                             │    │ 3. Check the Main PBA(PCB Board Ass'y)│
                             │    └────────────────────────────────────┘
                    ┌─────────────────┐
                    │       END       │
                    └─────────────────┘
```

7-4 Panel PBA and Media Sensor Problem

```
        ( Panel PBA )
        ( Problem  )
             │
             ▼
     ┌──────────────────┐
     │ Turn on the power │
     └──────────────────┘
             │
             ▼
         ◇ LED Ok? ◇ ──────No──────┐
         (TP41,43,44)               │
             │                      ▼
            Yes        ┌───────────────────────────────────────────────┐
             │         │ 1. Check the LED Signal from CPU on Main PBA   │
             ◄─────────│ 2. Check the Harness (Signal, VCC, GND)        │
             │         │ 3. Check the related Circuit, Pattern & Component│
             ▼         │ 4. Replace the Panel PBA                       │
        ◇ Feed S/W Ok? ◇ ──No──┐   └───────────────────────────────────────────────┘
          (TP42)               │
             │                 ▼
            Yes    ┌──────────────────────────────────────────────────┐
             │     │ 1. Check the Feed S/W Signal on Main PBA          │
             ◄─────│ 2. Check the Harness                              │
             │     │ 3. Check the related Circuit ,Pattern & Component │
             ▼     └──────────────────────────────────────────────────┘
        ◇ Cover Open ◇ ──No──┐
          S/W Ok?            │
             │               ▼
            Yes    ┌──────────────────────────────────────────────────┐
             │     │ 1. Check the Cover Sensor Signal on Main PBA      │
             ◄─────│ 2. Check the Harness                              │
             │     │ 3. Check the related Circuit ,Pattern & Component │
             ▼     └──────────────────────────────────────────────────┘
          ( END )


        ( Sensor  )
        ( Problem )
             │
             ▼
        ◇ Transmission Ok? ◇ ──No──┐
           (TP89)                  │
             │                     ▼
            Yes    ┌──────────────────────────────────────────────────┐
             │     │ 1. Check the CN5(Vcc, SEN-OUT) on Main PBA        │
             ◄─────│ 2. Check the Harness                              │
             │     │ 3. Check and Replace the Sensor-down PBA          │
             ▼     └──────────────────────────────────────────────────┘
        ◇ Reflective Ok? ◇ ──No──┐
          (TP89, Q11)            │
             │                   ▼
            Yes    ┌──────────────────────────────────────────────────┐
             │     │ 1. Check the CN5(Vcc, SEN-OUT, IR-CTRL) on Main PBA│
             ◄─────│ 2. Check the Harness                              │
             │     │ 3. Check and Replace the Sensor PBA              │
             ▼     └──────────────────────────────────────────────────┘
          ( END )
```

7-5 Thermal Printer Head and Step Motor Problem

```
        ┌──────────────┐
        │     TPH      │
        │   Problem    │
        └──────────────┘
               │
               ▼
        ╱─────────────╲
       ╱ Control Signal ╲            No        ┌─────────────────────────────────────────┐
      ⟨    Ok?          ⟩──────────────────────│ 1. Check the Control Signal on CPU        │
       ╲ (TP62,65,68,69)╱                      │    (TPH_DI, TPH_LAT, TPH_STB1, TPH_STB2)  │
        ╲─────────────╱                        │ 2. Check the Harness                      │
              │ Yes                            │ 3. Check the related Circuit & Pattern    │
              ▼                                └─────────────────────────────────────────┘
        ╱─────────────╲
       ╱  Power Ok?    ╲             No         ┌─────────────────────────────────────────┐
      ⟨   (TP58,64)    ⟩──────────────────────│ 1. Refer to the "Power Problem"           │
       ╲             ╱                         │    (TPH_24V, VDD_5V)                      │
        ╲─────────────╱                        │ 2. Check the Harness                      │
              │ Yes                            └─────────────────────────────────────────┘
              ▼
        ┌──────────────┐
        │     END      │
        └──────────────┘


        ┌──────────────┐
        │  Step Motor  │
        │   Problem    │
        └──────────────┘
               │
               ▼
        ╱─────────────╲
       ╱ Step Motor Ok?╲            No          ┌─────────────────────────────────────────────────┐
      ⟨  (TP82,83,85,86)⟩──────────────────────│ 1. Check the Power VDD_24V (TP74)                │
       ╲             ╱                          │ 2. Check the Phase Signal on CPU (TP82, TP83)    │
        ╲─────────────╱                         │ 3. Check the Output Signal of U21 (TP85, TP86)   │
              │ Yes                             │ 4. Check the Harness                             │
              ▼                                 │ 5. Check the Step Motor and the related Circuit  │
        ┌──────────────┐                        │    & Pattern                                     │
        │     END      │                        └─────────────────────────────────────────────────┘
        └──────────────┘
```

7-6 RS-232C Serial Communication Problem

Flowchart:

- **RS-232C Problem**
- **Communication Failure?**
  - No →
    1. Check the connection of the RS-232C Connector and Other side
    2. Check the interface Cable whether it is connected or not.
    3. Check the TxD, RxD Pin on CPU (R24, R25)
    4. Check the ST3232(U20) Driving Chip and related Circuit on Main PBA
    5. Check whether Signal is affected by the Cable Noise
  - Yes →
- **H/W Handshake**
  - No →
    1. Check the connection of the H/W handshaking Line and Other side (DTR/DSR)
    2. Check the interface Cable whether it is open or short
    3. Confirm the H/W handshaking Protocol
  - Yes →
- **END**

7-7 USB Communication Problem

```
        ┌─────────────┐
        │    USB      │
        │  Problem    │
        └─────────────┘
               │
               ▼
         ◇ Main PBA I/F ◇ ──────No──────┐
           Failure?                      │
               │                         │
              Yes                        ▼
               │              ┌──────────────────────────────────────┐
               │              │ 1. Check the connection of the       │
               │◄─────────────│    USB Connector and Other side      │
               │              │ 2. Check the Signal Line (D+, D-)     │
               │              │ 3. Check the Main Clock (12MHz, X2)   │
               │              │ 4. Check the related Circuit & Pattern│
               │              │    on Main PBA                        │
               ▼              └──────────────────────────────────────┘
         ◇ Reverse Mode ◇ ────No──────┐
           Failure?                    │
               │                       │
              Yes                      ▼
               │             ┌──────────────────────────────────────┐
               │             │ 1. Check the D+, D- Level             │
               │◄────────────│ 2. Check the Host whether it works    │
               │             │    correctly                          │
               │             │ 3. Check the USB Cable whether it is  │
               ▼             │    open or short                      │
        ┌─────────────┐      │ 4. Check the related Circuit & Pattern│
        │    END      │      │    on Main PBA                        │
        └─────────────┘      └──────────────────────────────────────┘
```

7-8 Ethernet Communication Problem

```
                    ┌─────────────┐
                    │  Ethernet   │
                    │  Problem    │
                    └─────────────┘
                          │
                          ▼
                    ╱───────────╲
                   ╱ Ethernet LED ╲──────── No ────────┐
                   ╲    Off?      ╱                     │
                    ╲───────────╱                      │
                          │                            │
                          │                            ▼
                                          ┌──────────────────────────────────┐
                                          │ 1. Check the connection of the     │
                         Yes              │    RJ45 Jack and Other side(UTP Cable) │
                          │               │ 2. Check the Ethernet Power (VDD_3.3V) │
                          ◄───────────────┤ 3. Check the Clock (25MHz, EX2)    │
                                          │ 4. Check the Signal of PHY Chip(EU9) │
                                          │    (MII Interface, nRESET)         │
                                          │ 5. Check the related Circuit & Pattern on Main PBA │
                                          └──────────────────────────────────┘
                          │
                          ▼
                    ╱───────────╲
                   ╱ Communication ╲─────── No ────────┐
                   ╲   Failure?   ╱                     │
                    ╲───────────╱                      │
                          │                            │
                          │                            ▼
                                          ┌──────────────────────────────────┐
                                          │ 1. After it Confirms the printing results of Ethernet RESET │
                         Yes              │    S/W, Check the TCP/IP Ethernet Setting │
                          │               │ 2. Check the Clock(25MHz) of ER49 │
                          ◄───────────────┤ 3. Check the Data Line of EU9    │
                                          │ 4. Check the Ethernet Cable whether it is open or short │
                                          │ 5. Check the related Circuit & Pattern on Main PBA │
                                          └──────────────────────────────────┘
                          │
                          ▼
                    ┌─────────────┐
                    │    END      │
                    └─────────────┘
```

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