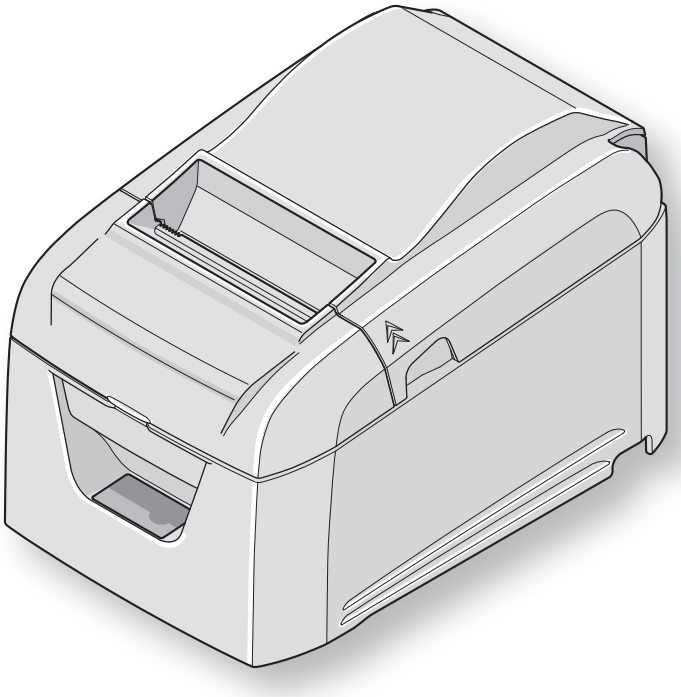
THERMAL PRINTER

BSC10 Series

Hardware Manual



Federal Communications Commission
Radio Frequency Interference
Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

FCC CAUTION:
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to
radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAN ICES-3 (A) / NMB-3 (A)

Caution Symbol

These symbols are located near the thermal print head.
Because the thermal print head is hot immediately after printing, do not touch it. Static electricity can damage the thermal print head. To protect the thermal print head from static electricity, do not touch it.

This symbol is located near the cutter.
Never touch the cutter blade, as you could injure your fingers.

This symbol is located near the peripheral drive connector.
Do not connect this to a telephone.

This symbol is located near the screws securing the case or the protective plate, which should not be opened by individuals other than service personnel. Individuals, other than service personnel, should not remove these screws. High voltage areas in the case can be dangerous.

EMI Class A Warning

http://www.starmicronics.com/support/mannualfolder/ClassA_Warning.pdf

Trademark acknowledgments

BSC10: Star Micronics Co., Ltd.

Notice

- All rights reserved. Reproduction of any part of this manual in any form whatsoever, without STAR's express permission is forbidden.
- The contents of this manual are subject to change without notice.
- All efforts have been made to ensure the accuracy of the contents of this manual at the time of going to press. However, should any errors be detected, STAR would greatly appreciate being informed of them.
- The above notwithstanding, STAR can assume no responsibility for any errors in this manual.

© Copyright 2011-2017 Star Micronics Co., Ltd.

TABLE OF CONTENTS

1. Unpacking and Installation.....1

1-1. Unpacking.....1

1-2. Notes about Installation.....1

2. Parts Identification and Nomenclature.....2

3. Setup 4

3-1. Connecting the Interface Cable to the PC 4

3-2. Connecting the Interface Cable to the Printer 5

3-3. Connecting the AC Adapter.....9

3-4. Turning the Power On 10

3-5. Connecting to a Peripheral Device 10

3-6. Loading a Paper Roll 11

3-7. Changing the Paper Width.....13

3-8. Setup Precautions 14

4. LED Display 16

4-1. Error Indicators.....16

5. Preventing and Removing Paper Jams.....17

5-1. Preventing Paper Jams.....17

5-2. Removing Paper Jams 17

5-3. Releasing the Cutter Lock 18

6. Maintenance 19

6-1. Thermal Head 19

6-2. Platen Rubber Roller 19

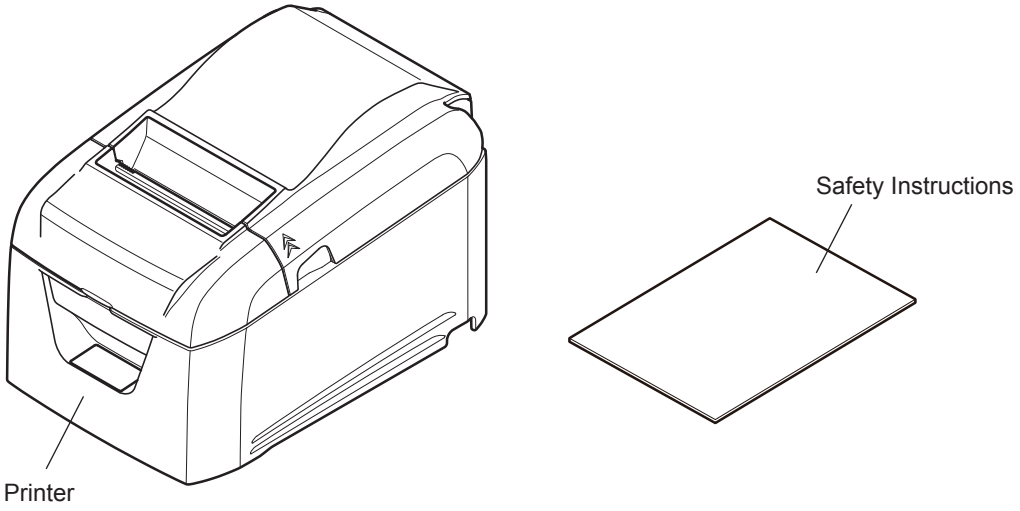
6-3. Paper Holder.....19

6-4. Sensors and Their Surrounding Area.....19

1. Unpacking and Installation

1-1. Unpacking

After unpacking the unit, check that all the necessary accessories are included in the package.

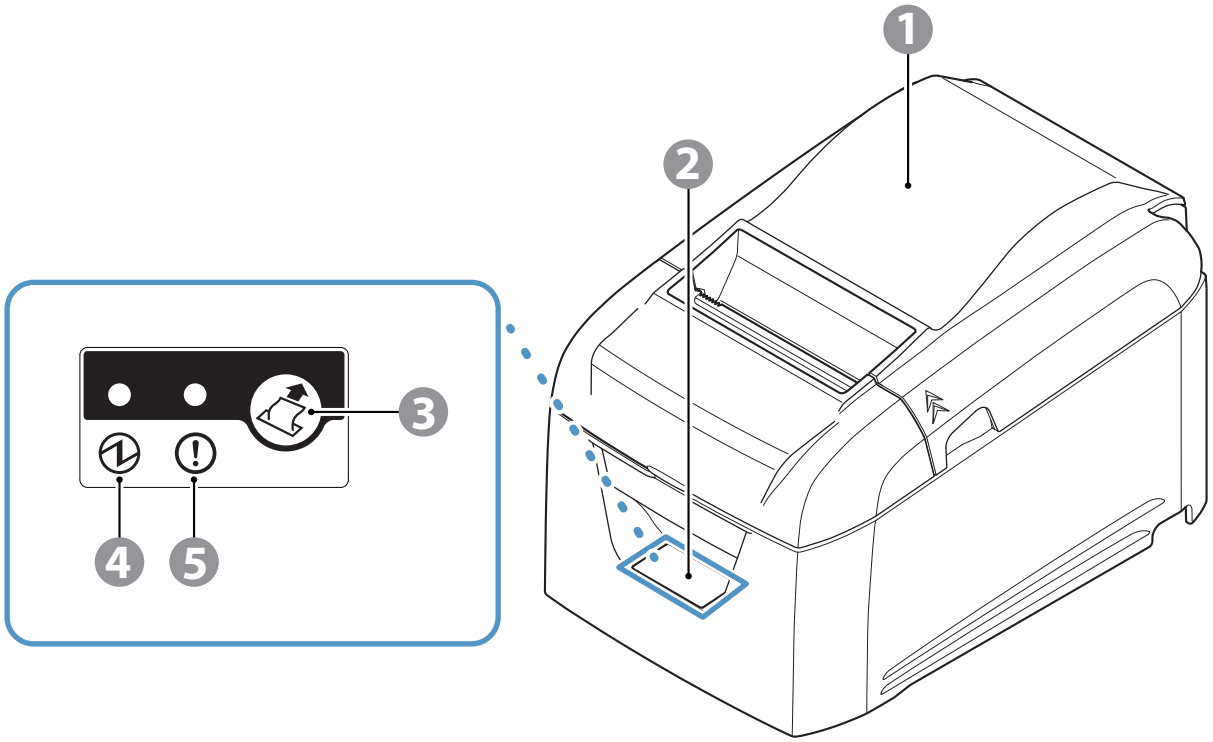


* Accessories vary depending on the model and the region where the printer was purchased.

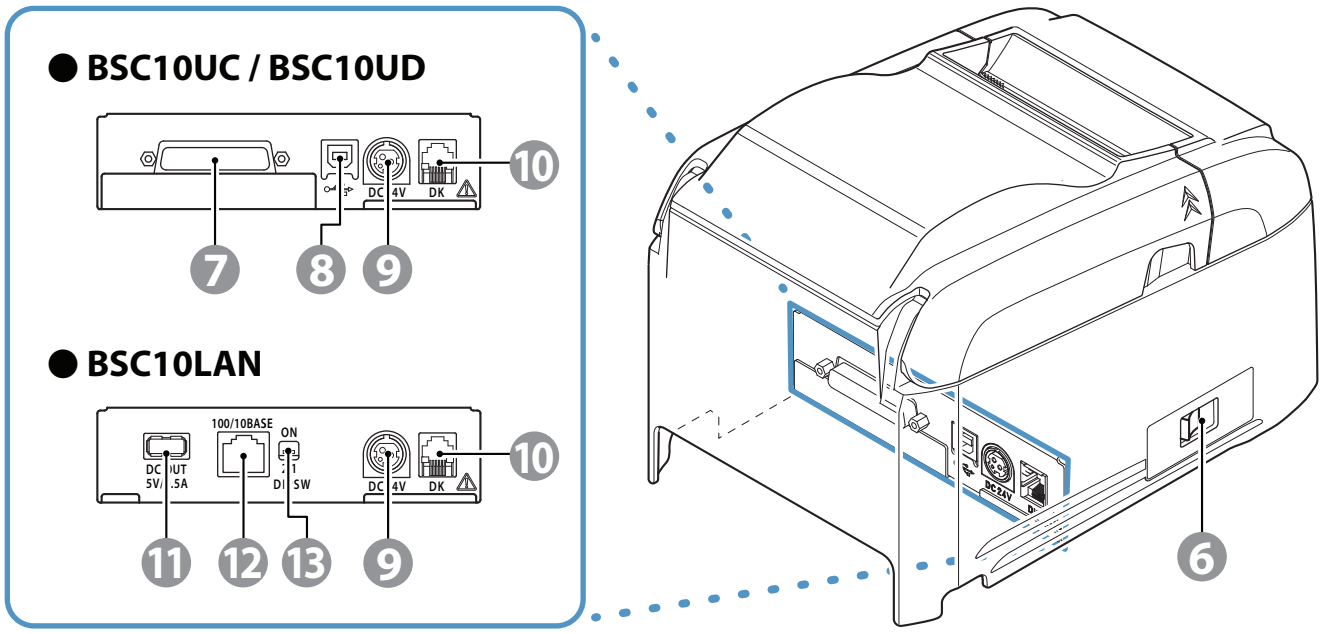
1-2. Notes about Installation

1. Choose a firm, level surface where the printer will not be exposed to vibration.
2. The power outlet you plan to connect to for power should be nearby and unobstructed.
3. Make sure that the printer is close enough to your host computer for you to connect the two.
4. Make sure that the printer is not exposed to direct sunlight.
5. Make sure that the printer is well away from heaters and other sources of extreme heat.
6. Make sure that the surrounding area is clean, dry, and free of dust.
7. Make sure that the printer is connected to a reliable power outlet. It should not be on the same electric circuit as copiers, refrigerators, or other appliances that cause power spikes.
8. Make sure that the room where you are using the printer is not too humid.
9. Use the printer within the boundaries indicated in the environmental requirements. Even when the ambient temperature and humidity are within the specifications, avoid radical changes in environmental conditions. The suitable operating temperature range is as follows:
   Operating temperature: 5°C to 45°C
10. When disposing of the printer, obey local regulations.

2. Parts Identification and Nomenclature



①	**Rear cover**	Open to replace paper. Do not open while printing.
②	**Control panel**	Features lamps that indicate printer status and a button for operating the printer.
③	**FEED button**	When the printer is online, pressing this button feeds the paper roll.
④	**POWER lamp (green)**	Lights when the printer is online. This lamp also indicates errors, in combination with other lamps.
⑤	**ERROR lamp (red)**	Lights when the cover is open. This lamp also indicates errors, in combination with other lamps.



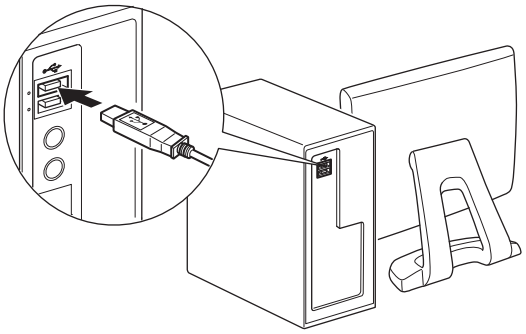
⑥	**Power switch**	Turns the printer on and off.
⑦	**Interface connector**	Connects to a host PC through a cable.
⑧	**USB port**	Connects to a host PC through a USB cable.
⑨	**Power inlet**	Connects to an optional AC adapter.
⑩	**Peripheral drive connector**	Connects to peripheral devices such as cash drawers. Do not connect this to a telephone line.
⑪	**USB connector (Host)**	5.0 V Outputs 0.5 A power. The USB communication function is not installed.
⑫	**Ethernet connector**	Connect to various host computers by Ethernet cable.
⑬	**Dip switches**	Sets the Ethernet function.

3. Setup

3-1. Connecting the Interface Cable to the PC

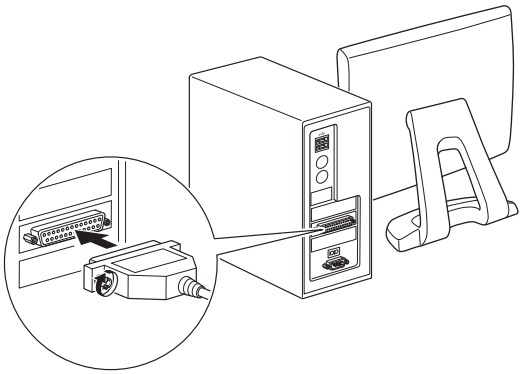
3-1-1. USB Cable

Connect the USB cable to the USB port on your PC.



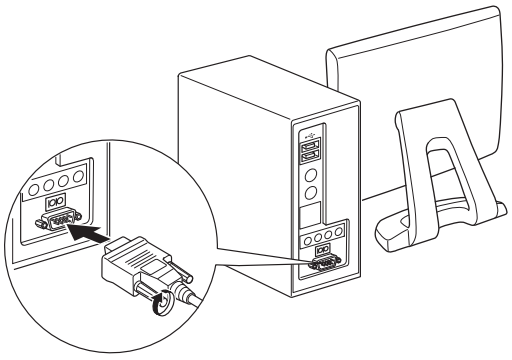
3-1-2. Parallel Cable

Connect the parallel cable to the parallel port on your PC.



3-1-3. RS-232C Cable

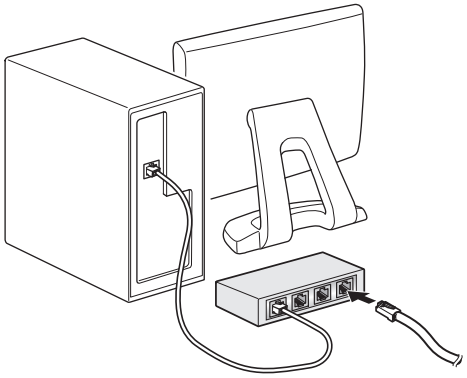
Connect the RS-232C cable to the RS-232C port on your PC.



3-1-4. Ethernet Cable

1) Connect the Ethernet cable to the Ethernet port on your PC.

2) Connect the computer's Ethernet port to the Ethernet port on a router or a hub and so on, with an Ethernet interface cable.



3-2. Connecting the Interface Cable to the Printer

Printer cables are not included in the package.
Obtain an appropriate cable that complies with the specifications beforehand.
Because the appropriate interface cable differs depending on the system that you are connecting the printer to, contact the dealer that you bought the product from if you are unsure about what cable to use.

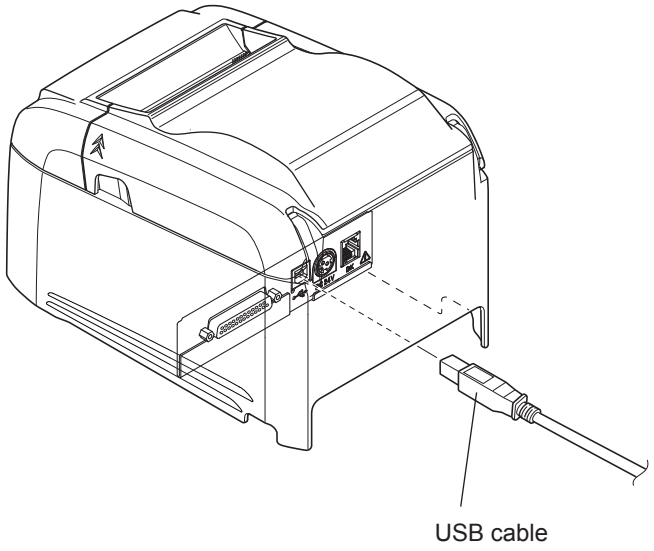
Before connecting or disconnecting an interface cable, be sure to disconnect the AC adapter's power cord from the outlet.

3-2-1. USB Cable

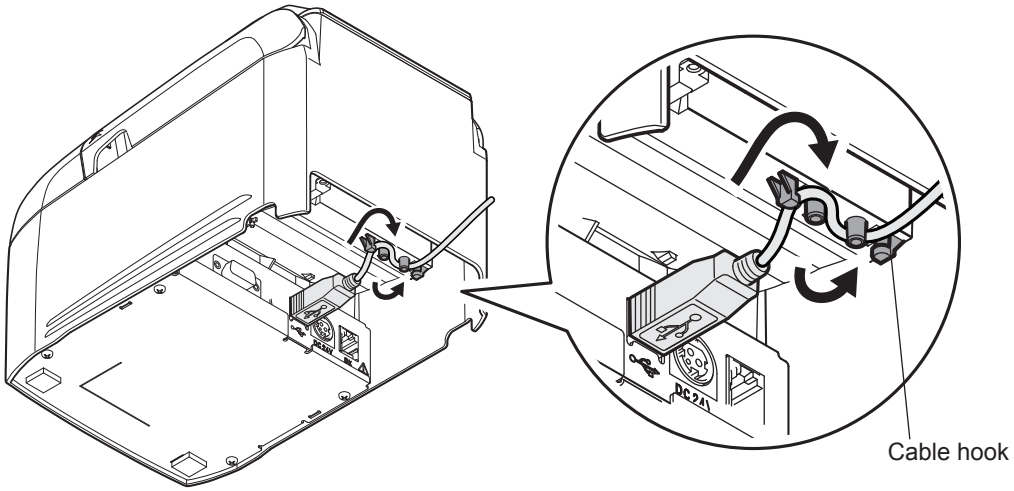
To connect a USB cable, follow the procedure given below.

1) Make sure that the AC adapter's power cord is not connected to the outlet.

2) Connect the USB cable to the USB port.



3) As shown in the figure, pass the cable through the cable hooks to hold it in place.

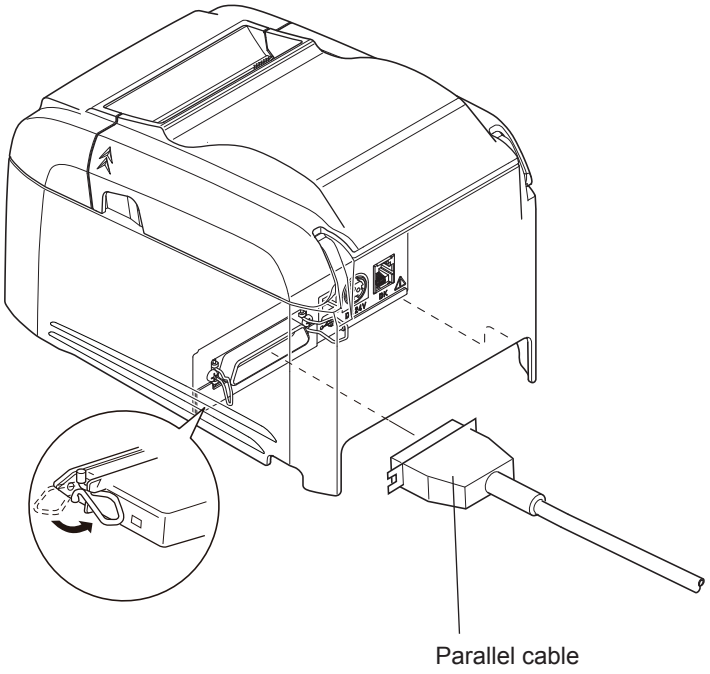


3-2-2. Parallel Cable

To connect a parallel cable, follow the procedure given below.

1) Make sure that the AC adapter's power cord is not connected to the outlet.

2) Connect the parallel cable to the connector on the parallel interface board, and fasten the connector clasps.

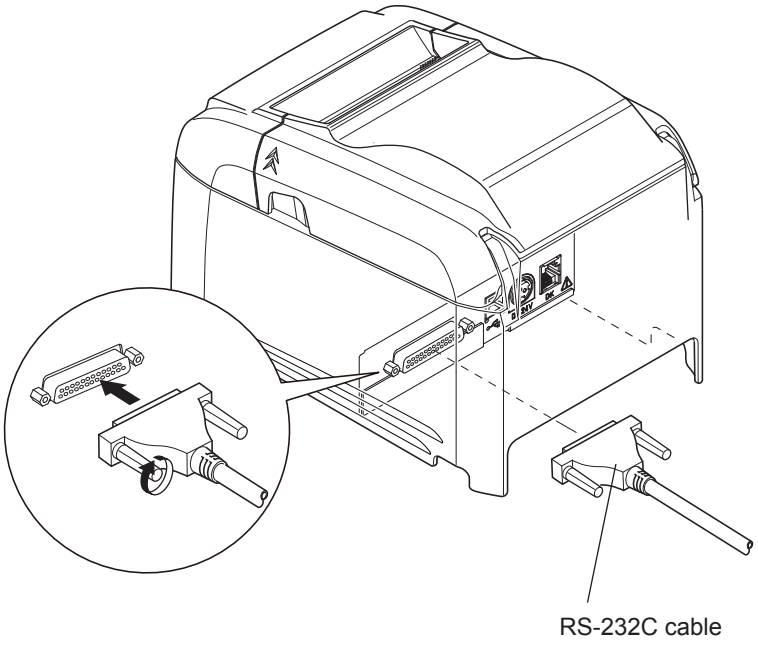


3-2-3. RS-232C Cable

To connect an RS-232C cable, follow the procedure given below.

1) Make sure that the AC adapter's power cord is not connected to the outlet.

2) Connect the RS-232C cable to the connector on the RS-232C interface board, and tighten the left and right screws.

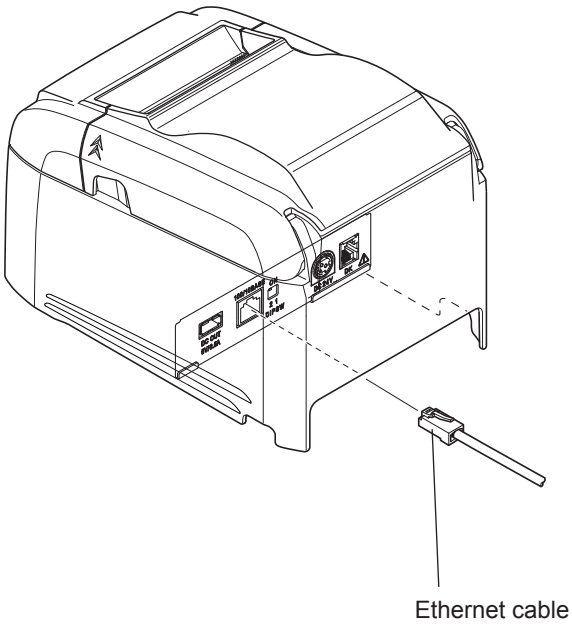


3-2-4. Ethernet Cable

To connect the cable, follow the procedure given below.

1) Make sure that the AC adapter's power cord is not connected to the outlet.

2) Connect the Ethernet cable to the Ethernet port.



■ **Link disconnection detection feature**

The Ethernet interface model is equipped with a link disconnection detection feature.

If the printer is turned on when an Ethernet cable is not connected to it, the POWER and ERROR lamps are simultaneously turned on and off at 4-second intervals to indicate the disconnection. Be sure to connect the Ethernet cable from a PC or hub to the printer, and then turn the printer on.

If the IP address is not recognized correctly, the POWER and ERROR lights continue to flash simultaneously every 0.25 seconds indicating that the link is broken. After setting the correct IP address, restart the printer.

■ About the Dip Switches

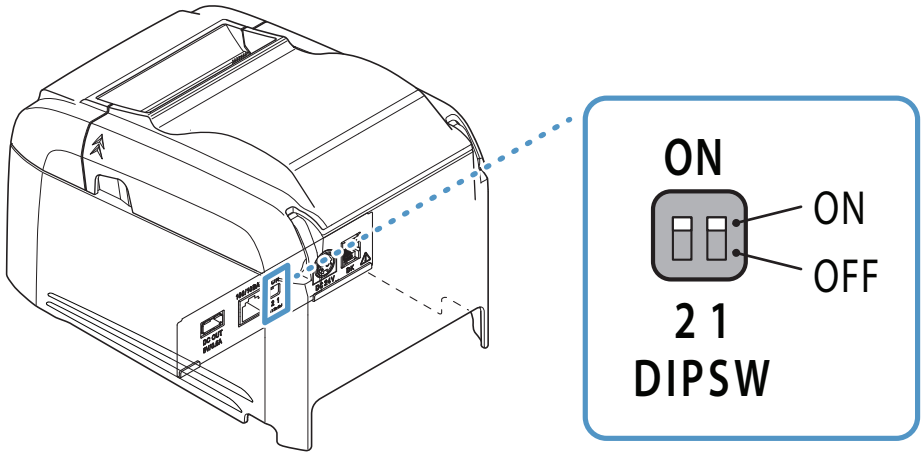
You can use the dip switches to make the following settings for the Ethernet functions.

Dip switch	Function	ON	OFF
1-1	Set DHCP address acquisition timeout	20 seconds	No Timeout
1-2	Reset network settings (*1)	Do not reset	Reset

By default, all settings are set to ON.

*1 Follow the steps below to reset network settings using the dip switches.

1) Check that the power switch is set to OFF, and that dip switch 1-2 is set to OFF.
2) Set the power switch to ON, and then wait for 15 seconds.
3) Set the power switch to OFF, and then set dip switch 1-2 to ON.
   * You cannot print when dip switch 1-2 is set to OFF.
   After resetting the network settings, make sure you set dip switch 1-2 to ON.



3-3. Connecting the AC Adapter

Note: Before connecting or disconnecting the AC adapter, make sure that the printer and all the devices connected to it are turned off.

Then remove the power cord from the outlet.

1) Connect the AC adapter to the power cord.

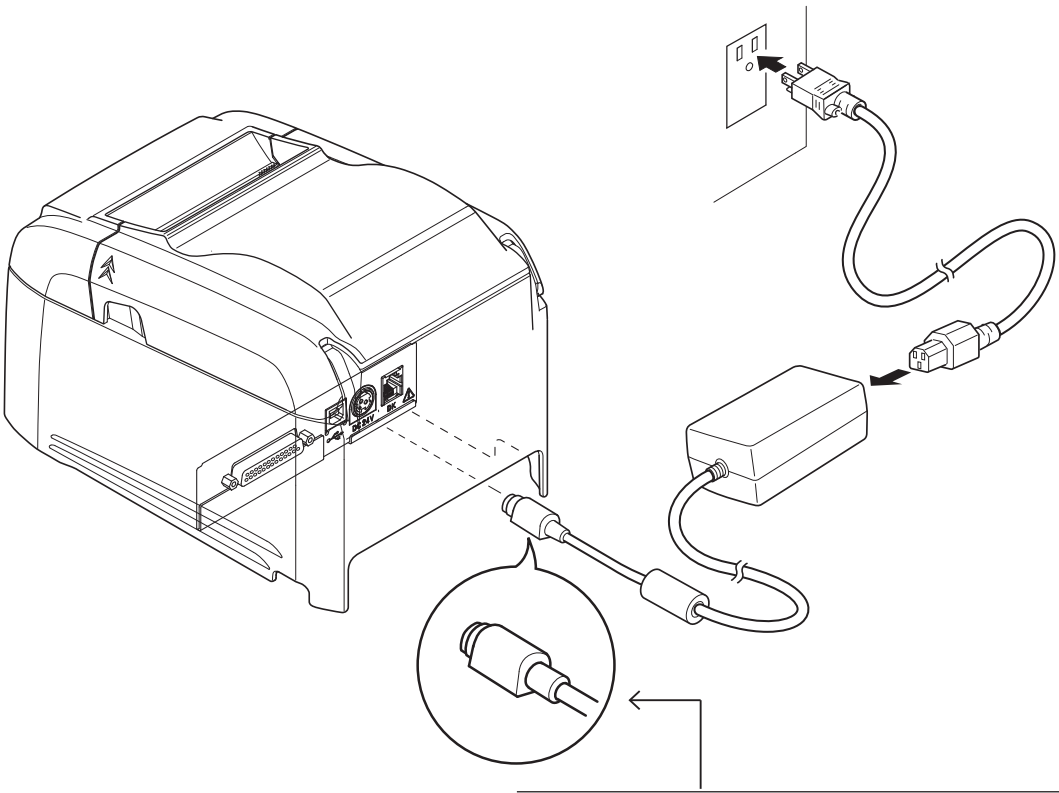
Note: We recommend that you use the standard AC adapter and power cord.

If you are not using the optional AC adapter (PS60A-24 series) and are instead preparing your own power supply, note the following points.

- **Use a power supply that is 24 VDC ± 10% and 2.1 A or more.**
  (Select a power supply with current capacity that is appropriate for the actual printing ratio.)
- **Use a power supply that supports with SELV output.**
- **Take into consideration the noise in the environment that the printer is installed in, and take appropriate measures to protect the printer from static electricity, AC line noise, etc.**

2) Connect the AC adapter to the connector on the printer.

3) Insert the power cable plug into an AC outlet.



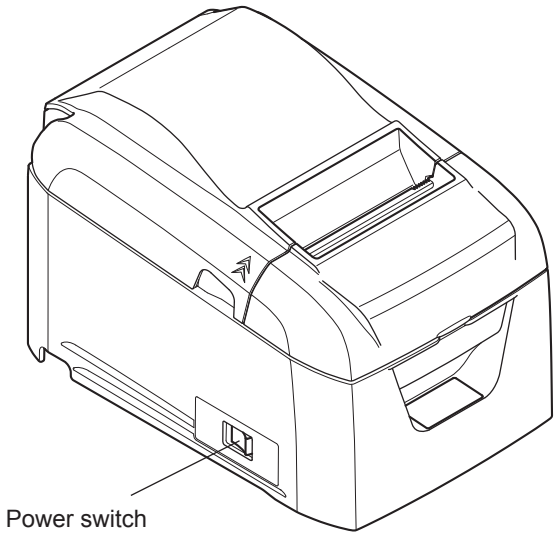
⚠ CAUTION

When disconnecting the cable, take hold of the cable connector to pull it out. Releasing the lock makes it easy to disconnect the connector.
*Pulling the cable excessively could cause damage to the connec*tor.

3-4. Turning the Power On

Connect the power cord according to the procedure in section 3-3, “Connecting the AC Adapter”.

Turn on the power switch, which is on the left side of the printer.
The POWER lamp on the control panel will light.



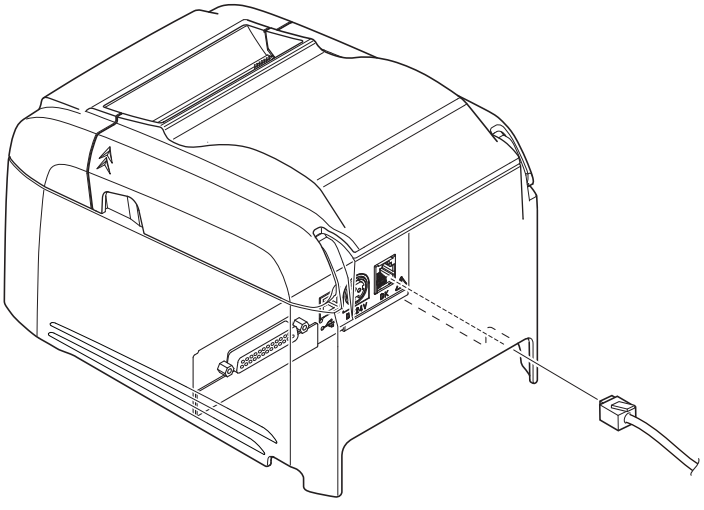
3-5. Connecting to a Peripheral Device

You can connect a peripheral device to the printer using a modular plug.
Follow the procedure given below.

1) Make sure that the AC adapter’s power cord is not connected to the outlet.

2) Connect the modular jack plug to the peripheral drive connector on the rear panel of the printer.
Connect the other end of the cable to the modular jack of the peripheral device.

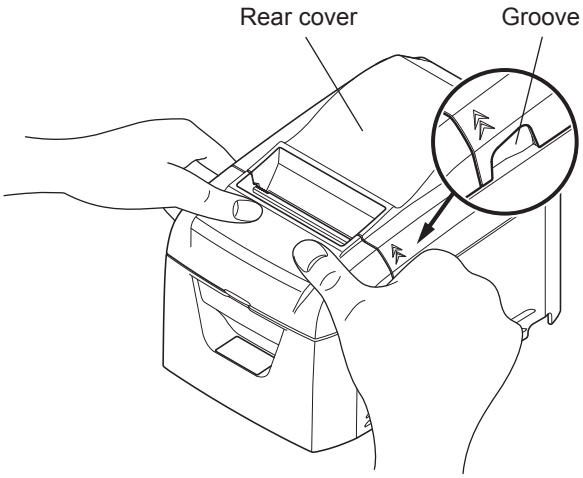
⚠ CAUTION: Do not connect a telephone line to the peripheral drive connector. Doing so may cause the printer to malfunction. Also, for safety purposes, do not connect a wire that may carry excessive voltage to the peripheral drive connector.



3-6. Loading a Paper Roll

Use a paper roll that complies with the printer specifications. (See section 3-6-1, “Compliant Paper Roll Specifications”.)

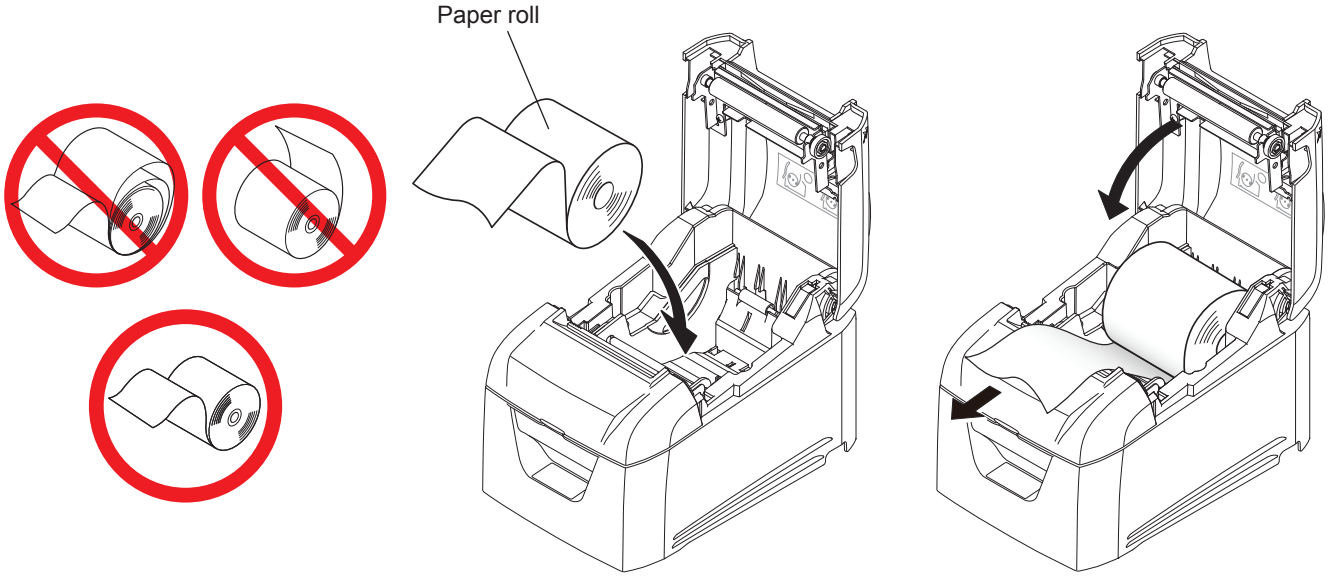
1) Put your fingers in the grooves on either side of the printer, and open the rear cover.



2) Load the paper roll into the printer in the direction indicated by the figure, and pull the leading edge of the paper straight toward you.

Note 1: Pull the paper straight as you pull it out.

2: Be careful not to pull the paper out at an angle, because doing so may cause the paper to jam or skew.



3) Push on both sides of the rear cover to close it.

Note 1: Be sure not to close the rear cover by pushing only one side.

2: Be careful not to get your fingers caught when opening or closing the printer’s rear cover.

3: After the rear cover is closed, the printer performs initial operations (from paper feeding to paper cutting). Do not open the rear cover until the initial operations are complete.

3-6-1. Compliant Paper Roll Specifications

Paper thickness	65 µm to 85 µm
Paper width	79.5 ± 0.5 mm 57.5 ± 0.5 mm **Note: Never change the paper width while the printer is in use.**
External dimensions **• Roll diameter** **• Take up paper roll width**	 Max. 102 mm $80\ ^{+0.5}_{-1}$ mm / $58\ ^{+0.5}_{-1}$ mm
Core inner and outer diameters	Inner diameter 12 ± 1 mm, external diameter 18 ± 1 mm
Printed surface	Outer edge of roll *** You cannot use inner-wrapped paper rolls.**

Note 1: Do not glue or tape the paper roll and shaft core together.

2: Do not fold the tail end of the paper.

3: For details on recommended thermal paper, see the following webpage.

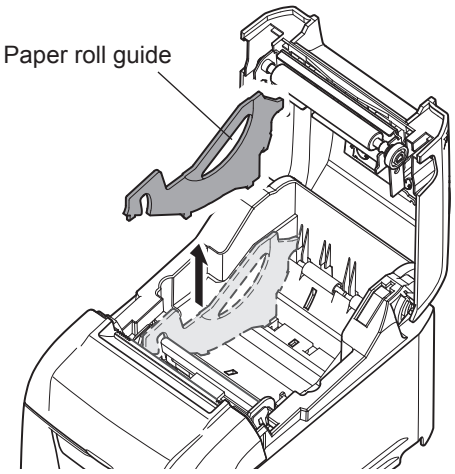
http://www.starmicronics.com/support/

3-7. Changing the Paper Width

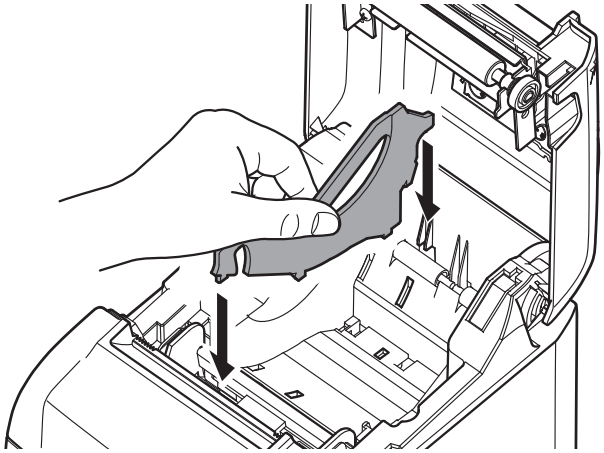
Move the paper roll guide to match the paper roll width. When you change the effective print width (paper roll width), change the printer utility's memory switch setting. For details, see the printer utility help.

* The following procedure is for changing the paper width from 80 mm to 58 mm.

1) Remove the paper roll guide.

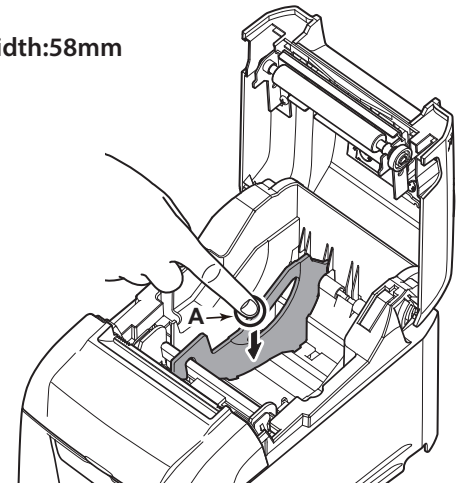


2) As shown in the figure, insert the paper roll guide in the groove.

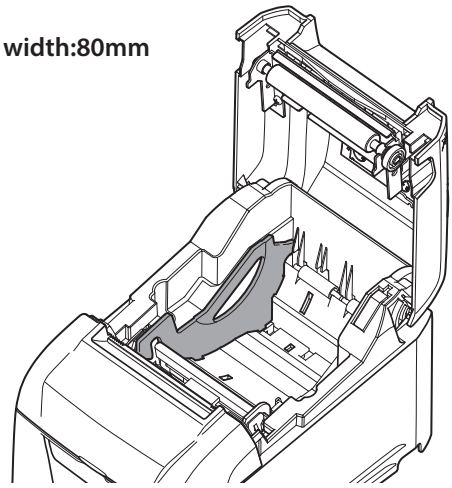


3) Secure the paper roll guide in place by pushing the section marked as "A" in the figure.

Paper width:58mm



Paper width:80mm



Note 1: Do not change the paper width while the printer is in use.
The amount of wear on the thermal head, rubber roller, and cutter varies depending on the paper width. This varying amount of wear may cause problems in printing and cutting.

2: Do not remove the paper roll guide from the printer when using 80mm width paper.

3-8. Setup Precautions

Caution Symbol

These symbols are located near the thermal print head.
Because the thermal print head is hot immediately after printing, do not touch it. Static electricity can damage the thermal print head. To protect the thermal print head from static electricity, do not touch it.

This symbol is located near the cutter.
Never touch the cutter blade, as you could injure your fingers.

This symbol is located near the peripheral drive connector.
Do not connect this to a telephone.

This symbol is located near the screws securing the case or the protective plate, which should not be opened by individuals other than service personnel. Individuals, other than service personnel, should not remove these screws. High voltage areas in the case can be dangerous.

⚠ WARNING

- ✓ If you notice smoke or strange odors coming from this product, turn the power switch off immediately, and remove the power cord from the AC outlet. For repairs, contact the dealer that you bought the product from.
- ✓ Never attempt to repair the product yourself. Doing so can be dangerous.
- ✓ Never disassemble or modify the product. Doing so may result in injury, fire, or electric shock.
- ✓ On models that have cutters or tear bars, do not touch the cutter blade or the tear bar.
  - There is a cutter or tear bar inside the paper outlet slot. Never put your hand in the slot regardless of whether or not the printer is in operation.
  - You must open the printer cover to replace paper. However, because the cutter blade or tear bar is located inside of the cover, be careful not to bring your face and hands too close to the blade or tear bar when the cover is open.
- ✓ During and immediately after printing, the area around the print head is very hot. Don't touch it because you could be burned.
- ✓ Be sure to turn off the printer before performing maintenance on the cutter. Failing to do so is dangerous.

⚠ CAUTION

- ✓ We recommend that you unplug the printer from the power outlet whenever you do not plan to use the printer for long periods.
  Because of this, you should locate the printer so that the power outlet it is plugged into is nearby and easy to access.
- ✓ If an AC cord set is supplied with the product, the power cord that is included has been specially designed for the product.
- ✓ Make sure that the printer and the PC are turned off and unplugged from their AC outlets before you make connections.
- ✓ Do not connect a telephone line to the peripheral drive connector, which is used for devices such as cash drawers. Doing so may cause the printer to malfunction. Also, for safety purposes, do not connect a wire that may carry excessive voltage to the peripheral drive connector.

- ✓ Do not open the printer covers while the printer is printing or cutting.
- ✓ Do not pull out paper when the printer cover is closed.
- ✓ If liquid or foreign objects (such as coins and paper) enter the inside of the printer, turn the power switch off, disconnect the power cord from the AC outlet, and consult the dealer that you bought the product from.
  Continuing to use the printer may lead to a short-circuit, which may cause electric shock or fire.
- ✓ The heating element and the driver IC of the thermal print head are easily damaged. Do not touch them with metal objects, sandpaper, etc.
- ✓ Do not touch the thermal print head heating element. Doing so may make it dirty, which will decrease the printing quality.
- ✓ Static electricity can damage the driver IC and other components of the thermal print head. Avoid touching it directly.
- ✓ Do not operate the printer if there is moisture (which has been caused by condensation or another factor) on the front surface of the head.
- ✓ The printing quality and the thermal print head's service life cannot be guaranteed if paper other than the recommended paper is used.
  In particular, thermal paper containing Na+, K+, or C1- may drastically reduce the service life of the thermal print head.
  We recommend that you use paper with the following maximum ion densities: 500 ppm of Na+, 150 ppm of K+, and 300 ppm of Cl-.
  For details on recommended thermal paper, see the following webpage.
  http://www.starmicronics.com/support/

4. LED Display

4-1. Error Indicators

(1) Recoverable errors

Check the recovery conditions. The printer can be recovered while maintaining its current status.

Error description	POWER	ERROR	Recovery condition
Thermal head high temperature detection error	Flashes at 1-second intervals	Off	The printer recovers automatically when the thermal head cools.
Cover open error	On	On	The printer recovers when you close the cover.
Paper out error	On	Flashes at 1-second intervals	The printer recovers when you set a new paper roll and close the cover.
Ethernet link disconnection detection (Physical link disconnection)	Flashes at 4-second intervals	Flashes at 4-second intervals	Connect an Ethernet cable. For details, see section 3-2-4, "Ethernet Interface Cable."
Ethernet link disconnection detection (IP address lost)	Flashes at 0.25-second intervals	Flashes at 0.25-second intervals	Set the correct IP address and restart the printer.

(2) Unrecoverable errors

Turn the printer off, check the recovery conditions, and then turn the printer back on.

If the same error occurs after you turn the printer back on, the printer needs to be repaired.

Error description	POWER	ERROR	Cause	Recovery condition
Cutter error	Off	Flashes at 0.25-second intervals	Paper cutting in progress error	After you restart the printer, the printer recovers when the mobile cutter returns to its home position. (Note 3, 4)
Flash memory error	Off	Flashes at 1-second intervals	Flash memory access error	-
RAM error	Off	Flashes at 2-second intervals	RAM access error	-
Head thermistor error	Off	Flashes at 3-second intervals	Detection of head thermistor error	-
Power voltage error	Off	Flashes at 4-second intervals	Detection of power voltage error	Check the condition of the power supply, and restart the printer.

Note 1: If an unrecoverable error occurs, turn the power off immediately.

2: A power voltage error may be a result of a power supply malfunction.

3: If the paper is jammed, turn the power off, clear the jammed paper, and then turn the power back on. For details, see section 5-2, “Removing Paper Jams”.

4: If the mobile cutter cannot return to its home position or the printer cannot perform initial operations, manually unlock the cutter. For details, see section 5-3, “Releasing the Cutter Lock”.

If other unrecoverable errors occur, contact the dealer that you bought the product from for repairs.

5. Preventing and Removing Paper Jams

5-1. Preventing Paper Jams

When you set the paper roll into the printer, do not pull out the end of the paper at an angle.
Do not touch the paper roll when the printer is printing or feeding paper or before the cut operation has finished completely.
Holding or pulling the paper while it is being fed may cause paper jams, improper cutting, or improper line breaks.

Note: Do not remove the paper while it is being cut. This can cause a paper jam.

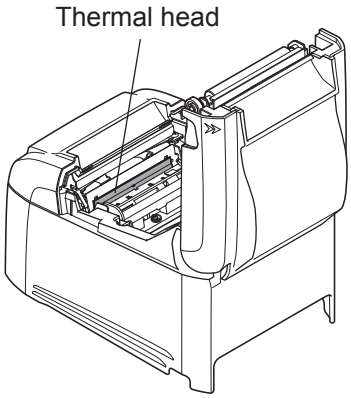
5-2. Removing Paper Jams

If a paper jam occurs, remove the paper according to the procedure given below.

1) Turn the power switch off.

2) Open the rear cover.

Note 1: If you cannot open the rear cover, see section 5-3, "Releasing the Cutter Lock".



3) Remove the jammed paper.

Note 1: Because the thermal head is hot immediately after printing, do not touch it.

2: Do not pull on the paper with the rear cover closed. Doing so may cause damage to or deformation of parts such as the thermal head and the rubber roller.

4) Load the paper roll straight, and gently close the rear cover.

Note 1: Load the paper roll straight.
If you close the rear cover with the paper roll skewed, paper jams may occur.

2: Push on both sides of the rear cover to close it securely.
Pushing the center section of the cover may cause only one side of the cover to be closed completely.
If the rear cover is not closed completely, the printer may not print.

5) Turn the power switch on.
Make sure that the ERROR lamp is not lit.

Note: When the ERROR lamp is lit, the printer will not accept any commands. Be sure to close the rear cover completely.

⚠ CAUTION

- ✓ **To avoid paper jams and other problems, feed the paper at least 1 mm (8 dot lines) before printing.**
- ✓ **If you want to use the cutter, to avoid paper jams and other problems, we recommend a margin of at least 5 mm from the end of the printed area to the cutting position.**

5-3. Releasing the Cutter Lock

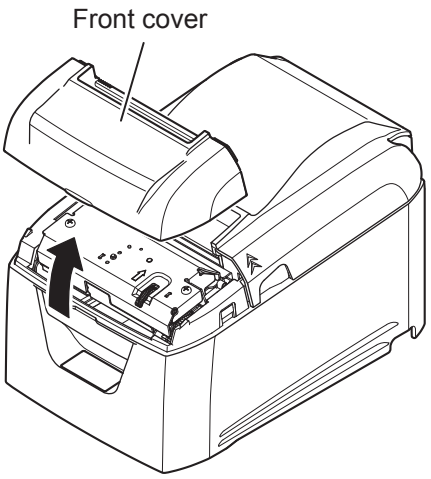
If the auto cutter locks up, restart the printer by turning the power switch off and then back on. A typical locked cutter will be restored when you restart the printer.

If restarting the printer does not release the locked cutter, follow the procedure below.

Note: Be sure to turn off the printer before performing maintenance on the cutter.

1) Turn the power switch off.

2) Remove the front cover.

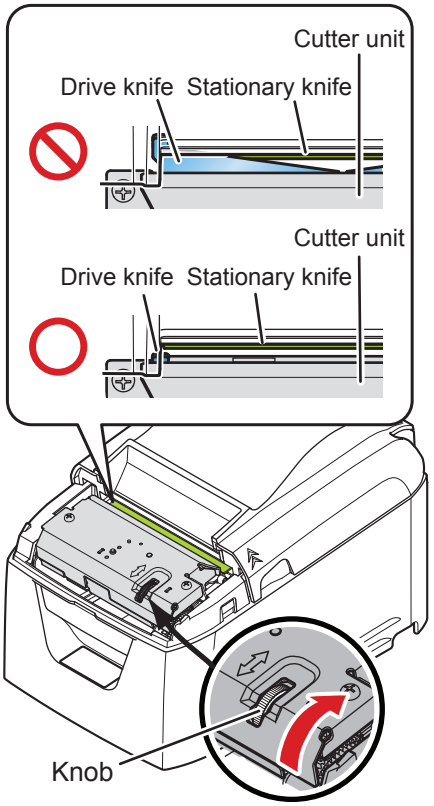


3) Remove the jammed paper.
   Note: When removing jammed paper, be careful not to damage the printer.
   In particular, the thermal head is easily damaged, so do not touch it.

4) Turn the knob in front of the cutter in the direction of the red arrow shown on the right until the rear cover can be opened.
   Note: If you can not turn the knob in the direction of the red arrow, turn it in the opposite direction until the rear cover can be opened.

5) Open the rear cover, remove the jammed paper, and reset the paper.

6) Attach the front cover, and turn the power switch on.



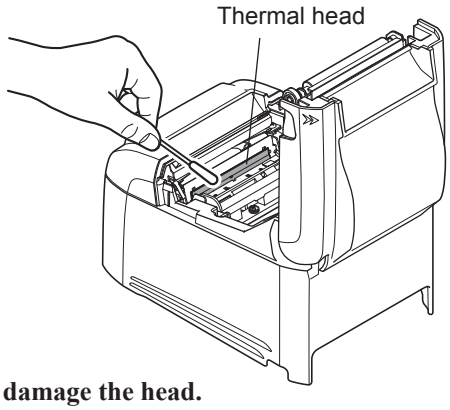
6. Maintenance

Accumulation of paper dust and dirt may cause the printer to not print portions of characters.
To prevent such problems, perform periodic maintenance, such as removing paper dust from the paper transport section and removing the blackened paper dust from the thermal head surface.
Note: Turn the printer's power switch off before performing maintenance.

As a guideline, clean the printer every six months or every 1 million lines of printing.

6-1. Thermal Head

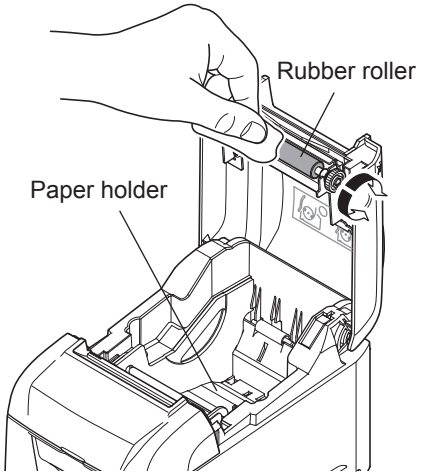
To remove the blackened paper dust that has accumulated on the thermal head surface, wipe it clean with a cotton swab (or soft cloth) dipped in alcohol (ethanol, methanol, or isopropyl).



Note 1: The thermal head is easily damaged.
Be sure to clean the thermal head with a soft cloth, and be careful not to damage the head.
2: Do not clean the thermal head immediately after printing, when the thermal head is hot.
3: Be careful of static electricity while cleaning the thermal head. Static electricity can damage the head.
4: Turn the power on only after the alcohol has dried completely.

6-2. Platen Rubber Roller

Using a dry, soft cloth, wipe off the dirt from the rubber roller.
Clean the entire rubber roller by rotating it.

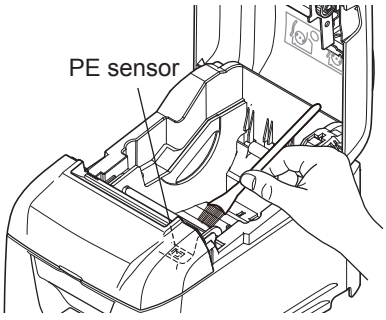


6-3. Paper Holder

Clean the paper holder of debris, dust, paper particles, etc. that may have accumulated.

6-4. Sensors and Their Surrounding Area

Clean the sensors of debris, dust, paper particles, etc.
In particular, if the reflection sensors are dirty, detection will not be performed properly.
Cleaning is relatively easy if you use a brush or a similar tool.



http://www.starmicronics.com/support/

Rev. 2.2