MOBILE PRINTER

# SM-L300 Series

## *Hardware manual*

## Federal Communications Commission
## Radio Frequency Interference Statement

This device complies with Part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s).
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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

**FCC WARNING**
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
For compliance with the Federal Noise Interference Standard, this equipment requires a shielded cable. For RF interference suppression, if a ferrite core is provided with this evice, affix it to the interface cable.

**NOTE:**
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment of and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

*The above statement applies only to equipments marketed in U.S.A.*

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

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65 and RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation(MPE). But it is desirable that it should be installed and operated keeping the radiator at least 20cm or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

Cet équipement est conforme aux limites d"exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles les radioélectriques (RF) de la FCC lignes directrices d'exposition dans le Supplément C à OET65 et d"exposition aux fréquences radioélectriques (RF) CNR-102 de l"IC. Cet équipement émet une énergie RF très faible qui est considérée conforme sans évaluation de l"exposition maximale autorisée. Cependant, cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps (à l"exception des extrémités : mains, poignets, pieds et chevilles)

**<Europe model>**

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# Declaration of Conformity

We declare, under our solo responsibility, that the product to which this declaration relates complies with the provisions of following European Directives:

**2014/53/EU**
**2011/65/EU , 2015/863**

harmonised standard

| | |
|---|---|
| RADIO : | **EN 300 328 V2.1.1** |
| EMC : | **EN 301 489-1 V1.9.2** |
| | **EN 301 489-17 V2.2.1** |
| | **EN 55032 : 2012 / AC:2013 Class B** |
| | **(Comments: EN 55032:2012 is included in EN 55032:2015.)** |
| | **EN 61000-3-2 : 2014** |
| | **EN 61000-3-3 : 2013** |
| | **EN 55024 : 2010** |
| SAFETY : | **EN 60950-1 : 2006 +A11:2009 +A1:2010 +A12:2011 +A2:2013** |
| | **EN 62311 : 2008** |
| ENVIRONMENT: | **EN 50581 : 2012** |

| | |
|---|---|
| Manufacturer's Name | **Star Micronics Co.,Ltd.** |
| Manufacturer's Address | **20-10 Nakayoshida, Suruga-ku, Shizuoka-shi, Shizuoka 422-8654 Japan** |
| Importer's Name | **Star Micronics Europe Ltd.** |
| Importer's Address | **Star House, Peregrine Business Park, Gomm Road, High Wycombe, Bucks. HP13 7DL, U.K.** |
| Type of Equipment | **Thermal Printer** |
| Model Name | **SM-L300 , SM-L304** |
| Ref. Radio Report No. | **17070454-CE-R1 , 17070454-CE-R2** |
| Ref. EMC Report No. | **17070105-CE-E1 , 17070105-CE-E2** |
| Ref. Safety Cert. No. | **17070105-CE-H , 17070105-CE-S** |
| Ref. Environ. Report No. | **SM-L300-RoHS-01** |

| | | | |
|---|---|---|---|
| Place | **High Wycombe - U.K.** | D. Pearce | (Signature) |
| Date | **10-07-2017** | **David Pearce** | (Full Name) |
| Year of 1st CE mark | **'17** | **Technical Director** | (Position) |

**Refer to QR Code below:**

***Trademark acknowledgments***

SM-L300: Star Micronics Co., Ltd.

***Notice***

# Caution Symbol

| | |
|---|---|
|  | This symbol is placed near the thermal head to indicate that it may be hot.<br>Never touch the thermal head immediately after the printer has been used. Let the thermal head cool for a few minutes before touching it. |
|  | This symbol is placed near the thermal head to indicate that it is easily damaged. Observe the precautions for handling electrostatic sensitive devices. |

# Safety Precautions **Please be sure to read**

**To use this product in safety, please follow the precautions given below.**

## ⚠WARNING

- ✓ If you notice smoke, a strange smell, or a strange sound, turn off the power immediately, and remove the USB cable and/or battery pack. Then contact the dealer.
- ✓ If any foreign material (metal scraps, water, or other fluid) enters the printer, immediately turn off the printer and remove the USB cable and/or battery pack. Then, contact your dealer for advice. Continued use of the printer could result in a fire.
- ✓ Never attempt to repair the printer yourself. Also do not disassemble or modify the product. Doing so could lead to injury, fire, or electric shock.
- ✓ Do not touch the tear bar.
- There is a tear bar inside the paper outlet slot. Neither put your hand in the paper outlet slot while printing is in progress, or put your hand into the outlet even when printing is not in progress.
- The printer cover can be opened when replacing the paper. However, since the tear bar is on the inside of the printer cover, be careful not to place your face or hands too close to the tear bar.
- ✓ During and immediately after printing, the area around the thermal head is very hot. Do not touch it, as you could be burned.
- ✓ If any battery fluid gets on your skin or clothing, immediately wash the affected area with fresh water. Otherwise, skin damage may result.
- ✓ The battery pack may be hot immediately after the product has been used.

## ■ Using the Printer

- ✓ Some semiconductors can be damaged by static electricity. Be sure to turn off the printer when inserting or removing the battery pack.
- ✓ Do not drop the printer or hit it against a hard object.
- ✓ Do not open the printer cover while the printer is printing.
- ✓ Before you open the printer cover, make sure that printing data is not being sent to the printer.
- ✓ Do not unplug or plug in a USB cable while the printer is printing or during communication.
- ✓ Do not touch a USB connector while the printer is printing.
- ✓ Turn off the printer when you are not using it.
- ✓ When the printer is used in a low temperature environment, the battery's performance will be diminished, and the amount of time that you can use the printer for may be reduced.
- ✓ Do not pull out paper while the printer cover is closed.
- ✓ The heating element and the driver IC of the thermal head are easily damaged. Do not touch them with metal objects, sandpaper, etc.
- ✓ Printing quality may suffer if the thermal head heating element becomes soiled by being touched with your hands. Do not touch the thermal head heating element.
- ✓ There is a risk of damage to the driver IC of the thermal head from static electricity. Never directly touch the IC.
- ✓ Do not operate the printer if there is moisture on the front surface of the head from condensation, etc.
- ✓ Static electricity can cause damage to each sensor. To protect the sensor from static electricity, do not directly touch it.

## ■ Thermal Paper Handling

- ✓ Only use thermal paper with the designated specifications. The printing quality and working life of the thermal head cannot be guaranteed if any paper other than that recommended is used. In particular, if ion concentration of [Na+, K+, Cl-] is high, it may drastically reduce the working life of the thermal head. Please exercise caution.
- ✓ Store the thermal paper in a cool, dry, dark location.
- ✓ Do not rub the thermal paper with a hard object.
- ✓ Do not leave the thermal paper in contact with plastic film, an eraser, or adhesive tape for a long period of time.
- ✓ Do not stack the thermal paper on fresh diazo copies or wet-type copies.
- ✓ Do not use chemical glue on the thermal paper.
- ✓ Do not use thermal paper that has been stored for a long period.

## ■ Operating Environment for the Printer

Before actually unpacking the printer, you should take a few minutes to think about where you plan to use it. Remember the following points when doing this.

- ✓ Do not use the printer in an environment in which it will be subject to strong shaking while it is printing.
- ✓ Be careful to ensure that the printer is not exposed to direct sunlight.

  The appropriate environment for using the printer is described below.
  Temperature: 0°C to 50°C
  Humidity: 20% RH to 85% RH (Must be no condensation)
- ✓ Do not place the printer near a copying machine or other device that produces a strong electro-magnetic field.
- ✓ Keep the printer sufficiently removed from heaters and other sources of heat.
- ✓ Use the printer in a clean, low-humidity environment that is free from dust.
- ✓ Avoid using the printer in high-humidity rooms.

## ■ Printer Maintenance

Please perform the following maintenance every 6 months.

- ✓ Thermal head

  Dip a cotton swab in an alcohol solvent (ethanol, methanol, or isopropyl alcohol), and clean the heating area of the head.
- ✓ Platen

  While turning the platen, use a soft dry cloth to lightly rub the entire surface of the platen and remove any foreign objects.
- ✓ Paper storage unit and the surrounding area

  Remove any dirt, dust, pieces of paper, etc., from the paper storage unit.
- ✓ Card reader

  Regularly blow air onto the card reader to remove any dust from the card slot.

## ■ Maintenance for using Linerless Label Paper

- ✓ Perform cleaning regularly so that the printer can be used safely and comfortably. (Every time when a paper roll is ended.)
- ✓ Cleaning points are as above except Card reader. (Thermal head, Platen, Paper storage unit, roller, paper path and the surrounding area)
- ✓ Remove any dirt, dust, pieces of paper and glue etc.

## ■ Using a Magnetic Card

- ✓ Do not bring magnets near the card, and do not store the card near a device that produces a magnetic field (such as a mobile phone, speaker, or TV). If you do so, the data on the card may be deleted.
- ✓ Do not leave the card in a high-temperature environment (such as the dashboard of a car). If you do so, the card may bend.
- ✓ Do not touch the card with dirty or wet hands. Also, do not attach adhesive tape or glue to the card. Failing to follow the above precautions could cause the card to stop working properly.

# Table of Contents

# 1. Product Overview

This printer is perfect for mobile banking systems, retail, POS (point of sale) terminals and other forms of mobile computing.

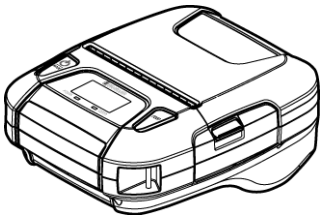
The characteristics of this printer are listed below:

- Support Label Paper and Linerless Label Paper
- Support to switch the de-curl function when receipt is used.
- Adjustable range of Roll Paper Width : 40 to 80mm
- Very silent printing direct thermal printing method
- Print maximum speed 65mm/s (Paper feed maximum speed 65mm/s)
- Support Bluetooth Ver3.0/4.0[BLE] Dual Mode
- Support Secure Magnetic Stripe Reader <Model with Card Reader>
  *AES or 3DES encryption
  *DUKPT Key Management
- Support Graphic OLED (128x64 dots)
- Belt Clip as a standard accessory
- Support text, barcode and graphic printing
- Drop-in design that makes it easy to load paper
- This printer is supported with the printer cover open sensor, paper end sensor, black mark sensor, transmissive sensor(gap sensor), thermal head thermister and printer internal thermister.

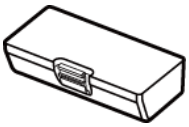
# 1.1 Printer & Accessories

The printer is packaged with the following accessories.

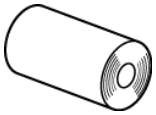
If any of these accessories is broken or missing, please contact the dealer that you bought the product.



Printer

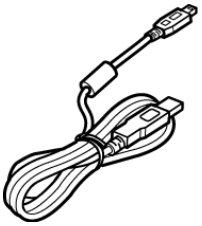


Battery Pack

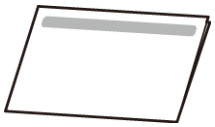


Sample Roll Paper

Belt Clip

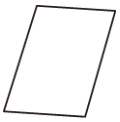


USB Cable

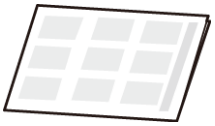


Easy Setup Guide

Ferrite Core



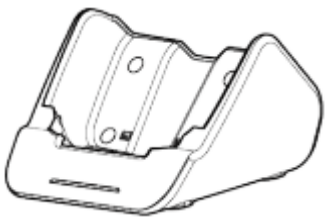
Ferrite Core Instruction Sheet



Safety Instruction Sheet

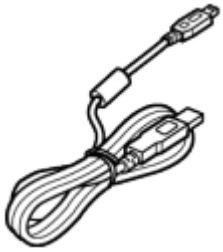
Safety Instruction For Battery Pack

**▶ The optional items for this printer are listed below.**



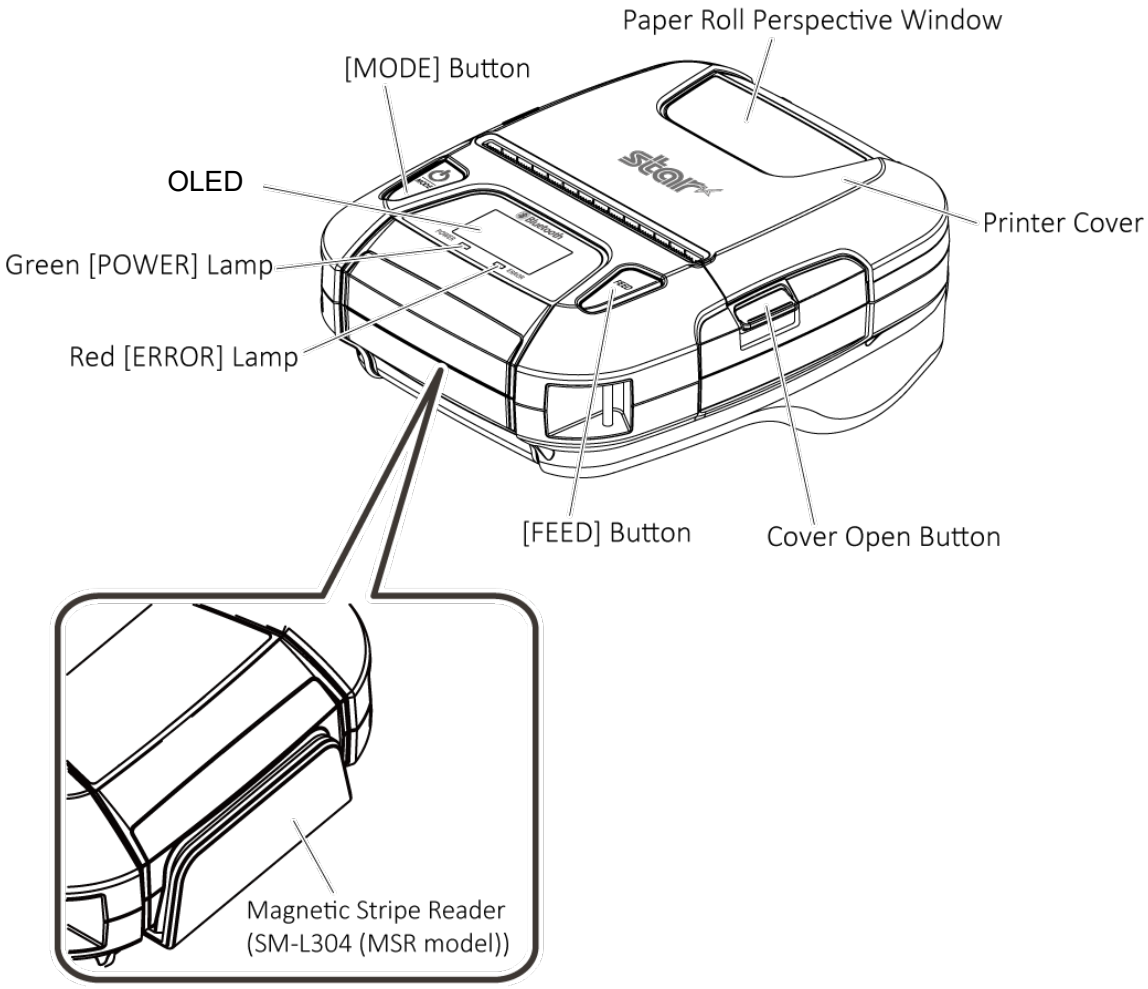
Charging Cradle

Battery Pack

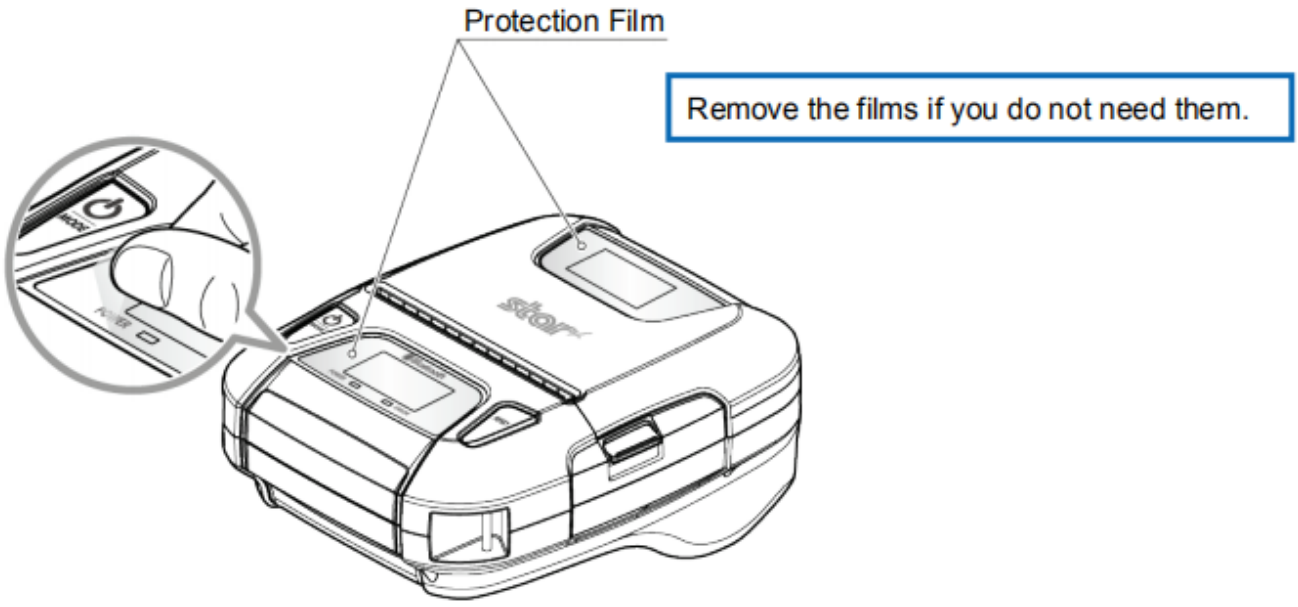


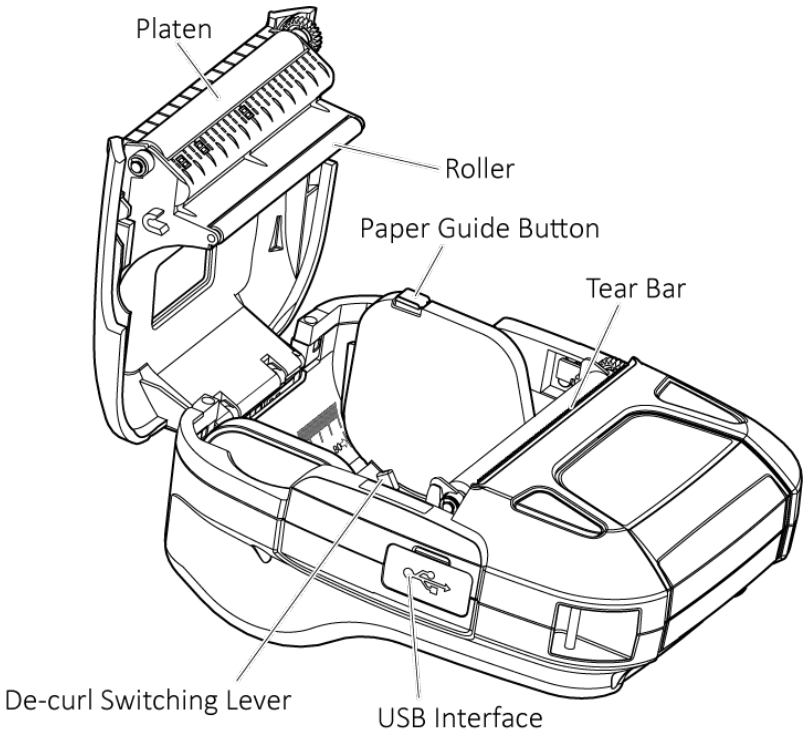
USB Cable

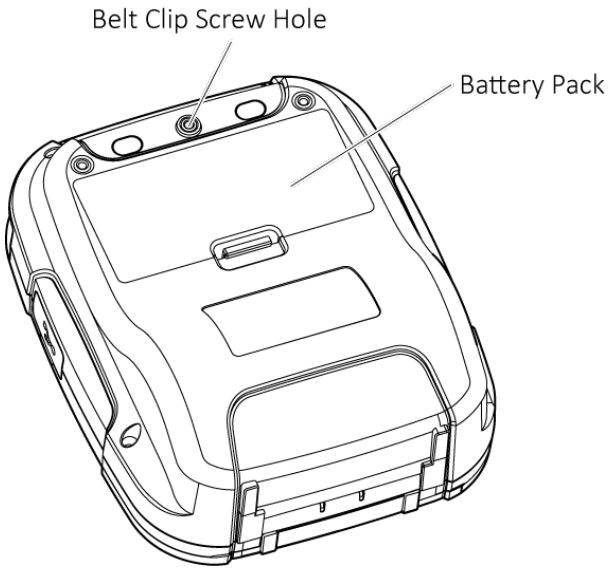
# 1.2 Appearance and Components




***NOTE: Only SM-L304 MSR model has the Magnetic Stripe Reader.***




Platen
Roller
Paper Guide Button
Tear Bar
De-curl Switching Lever
USB Interface

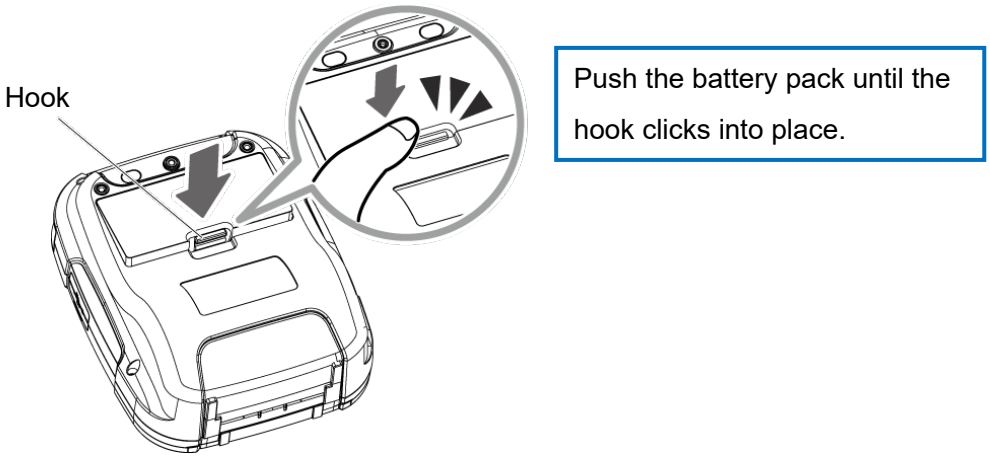

Belt Clip Screw Hole
Battery Pack

# 2. Setup

## 2.1 Battery Pack

### 2.1.1 Inserting into the Printer

1. Make sure that the printer has been turned off before you insert or remove the battery pack.
2. Insert the battery pack into the back of the printer as in the figure shown below, following the direction of the arrow.

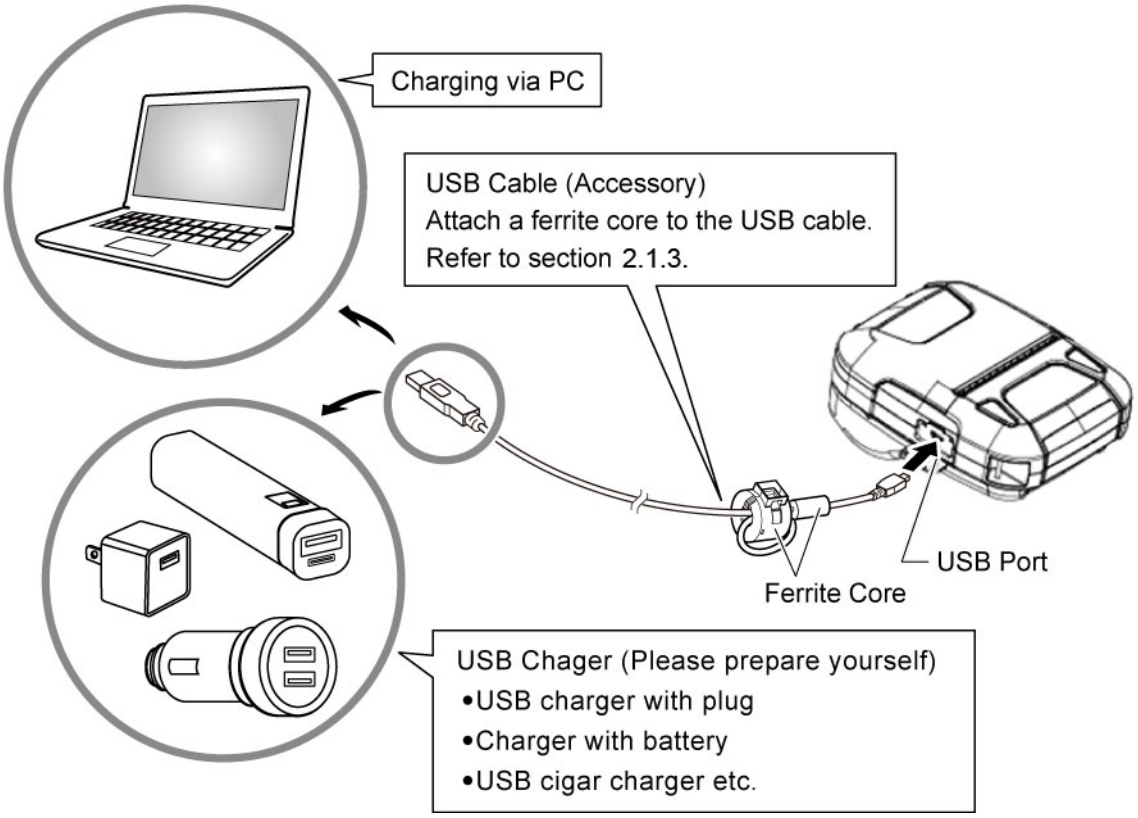



3. To remove the battery back, pull back the hook, and use the opposite procedure from the one you used to insert the battery pack.

## 2.1.2 Charging the Battery

Insert the battery pack into the printer to charge it.

Plug in socket with USB charging.




When battery pack runs out of power, the battery icon will flash. It powers off automatically when continues printing. If you want to go on, please recharge it.

Battery charging status descriptions are as follows.

| Printer status | While Charging | Charging is completed |
|---|---|---|
| **When power ON** | Power lamp is Flashing in green | Power lamp is constant on<br>*But if printer goes into Stand-by mode, power lamp will keep flash 1 time/ second. |
| **When power OFF** | Power lamp is Flashing in green | Power lamp is constant on |

***NOTE: However, a low-grade car charger may cause a trouble due to a sudden change of voltage. Use the charger that satisfies the USB standard.***

## ⚠ *Notes about the Battery Pack*

### ▸ General Battery Characteristics

- The battery is a consumable and its performance over time gradually decreases.
- While not in use of printer, the battery will slowly discharge itself.
- Prepare a battery pack that has been charged relatively recently (1 to 2 days earlier).
- To ensure that the battery lasts for a long time, we recommend that you turn off the printer whenever possible.
- When used at low temperatures, battery performance will temporarily decline. Be sure to have a fully-charged spare battery standing by if the printer will operate in a cold environment.

### ▸ Charging the Battery Pack

- The battery pack can be charged at ambient temperatures between 0°C and 40°C.
- The time required to charge the battery pack varies depending on the residual amount of battery, electrical current and the ambient temperature. Normally, it takes 5 to 6 hours to charge the battery pack.
- It will take longer to charge the battery from the PC than by the USB charger.
- It will take longer to charge the battery pack if you print while charging the battery pack.
- Do not remove the battery pack while it is being charged.
- Fully charge the battery prior to using the printer.
- There is no need to completely discharge or use up a rechargeable Lithium-ion battery before recharge it.
- It is normal for the battery pack to be hot after it has finished charging or been used.
- Do not recharge a battery pack that has just been fully charged.

### ▸ Battery Pack Life

- The battery can be charged approximately 300 times in the normal temperature range without losing performance. If an extreme decline in the running time of the battery is noticed, the battery is reaching the end of its usable life. It is recommended to replace the old battery with a new one.

### ▸ Notes about Using the Battery Pack

- Only use a designated battery pack. There is a risk of explosion or fire.
- Only use the designated battery charging method. There is a risk of explosion or fire.
- You cannot use a USB cable other than the designated USB cable.
- Do not throw the battery pack into a fire, place it near a flame or heating device, or use, charge or leave it in a hot environment (under direct sunlight, in a car, etc.). There is a risk of heat generation, smoke emission, explosion, fire, or battery acid leakage.
- Do not use a battery pack that has been dropped or subjected to a shock in some other way. There is a risk of heat generation, smoke emission, explosion, fire, or battery acid leakage.

- Do not disassemble or modify the battery pack. Doing so could lead to injury, fire, or electric shock.
- Do not short the terminals of the battery pack or get it wet.
- Do not put the battery pack in a bag with a metal object such as a key. There is a risk of heat generation, smoke emission, explosion, fire, or battery acid leakage.
- If the battery acid gets into contact with the eyes, wash eyes immediately with water and consult a doctor. Leaving your eyes untreated could result in blindness.
- If there is an abnormality such as heat generation, smoke emission, explosion, fire, or battery acid leakage while the battery pack is being used or stored, remove the battery pack from the printer immediately. Consult your dealer.

▸ **Notes about Storing the Battery Pack**

- The characteristics of the battery pack may degrade if you store it in a full-charged state for a long period of time. If you do not intend to use the battery pack for a while, store it in approx. 50%-charged state.
- If you do not intend to use the battery pack for a long time, be sure to remove it from the printer.
- Keep the battery out of the reach of children. In addition, be careful that children do not remove the battery.
- Store the battery pack in a cool place.
  * We recommend that you store the battery pack in a dry area with an ambient temperature of 15 to 25 ºC.
  * Avoid storing the battery in locations with high or extremely low temperatures.

**To prevent unrecoverable damage to the battery, keep in your mind the following guidelines.**

**- If the battery pack is not in use for a long time, please remove it after charging up to 50%.**

**- During storage, please charge the battery pack up to 50% every 3 months.**

**- When power is low, battery should be charged in time.**

**- If the printer automatically power down because of low power, be sure to charge the battery in 15 days.**

▸ **Battery Disposal and Recycling**

A battery pack is used to power this device. Since the disposal process of batteries varies from country to country, refer to the appropriate measures mandating the disposal method of the country in which this device is used.

**< For U.S.A. and Canada >**

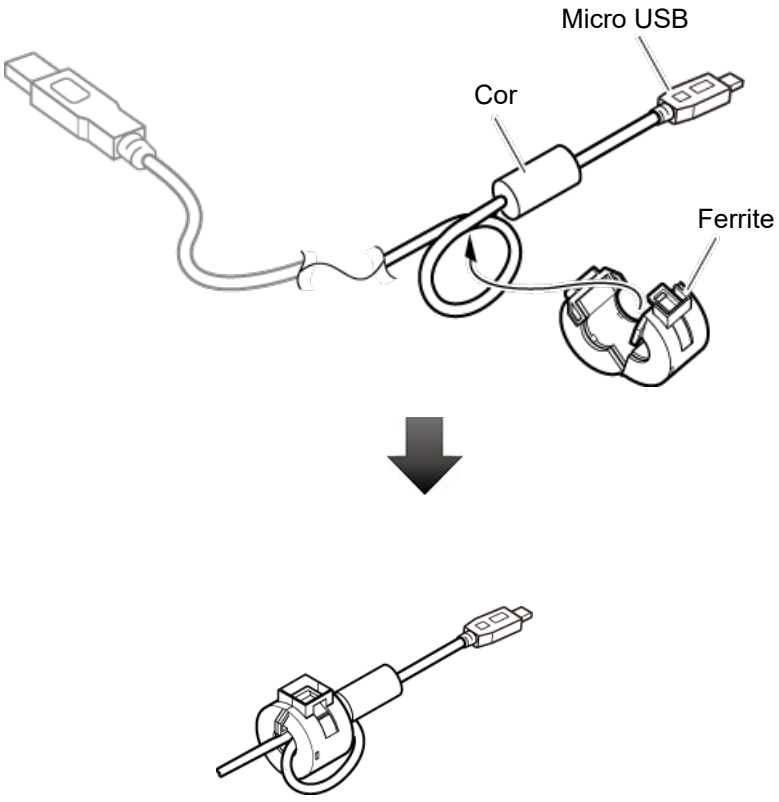
Lithium-Ion batteries are recyclable.

You can help preserve our environment by returning your used rechargeable batteries to the collection and recycling location nearest you. For more information regarding recycling of rechargeable batteries, call toll free 1-800-822-8837, or visit http://www.rbrc.org/

## 2.1.3 Ferrite Core

To reduce unnecessary radio wave radiation, attach a ferrite core to the USB cable included with the printer.

Make a loop with the USB cable close to the core at the Micro USB end and attach a ferrite core as shown in the drawing below.



# 2.2 Connecting a tablet or PC to the printer (pairing)

SM-L300 has two Bluetooth modes:
One is Bluetooth 4.0(BLE) without PIN for iOS system.
Another is Bluetooth Ver3.0 with PIN for Android or Windows system. SM-L300 changes the Bluetooth mode automatically by host system.

Pairing sets one by one in order, otherwise it can‘t figure out which one succeeds in pairing.

The device name displayed during pairing varies depending on the product. It can be checked from the [BD Name] that is printed when printer self-printing is performed (power is turned ON while depressing the FEED button).

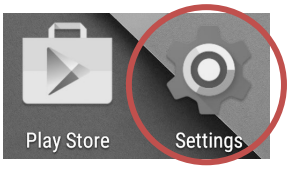
PIN and Device name can be changed through Star Utility. (PIN code default : 1234)
To obtain this utility, please contact with your dealer.

## 2.2.1 iOS

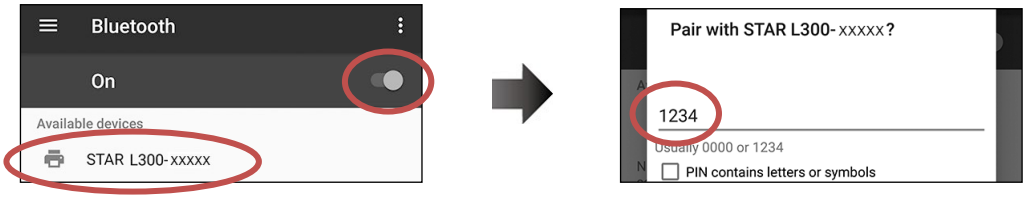
1. Press and hold MODE button for approx. 2 seconds, and printer is turned on.
2. Pairing is not required. Select the model from your application.
   Device name: “STAR L300-XXXXX”(default)
   (XXXXX is the last five digit number written in the "Serial No." column on the bottom of the printer.)

## 2.2.2 Android

1. Press and hold MODE button for approx. 2 seconds, and printer is turned on.
2. Open the tablet settings screen and select Bluetooth.



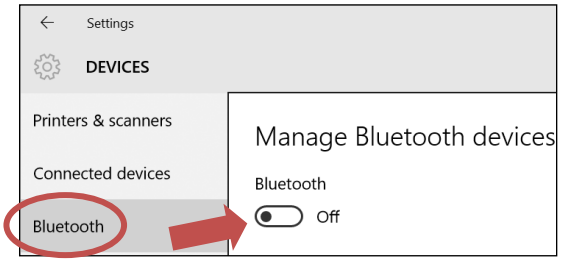

3. Turn ON Bluetooth.
   Select the displayed device name (STAR L300-XXXXX), and enter the PIN code.




4. When the device name is displayed under "Paired devices", pairing is completed.

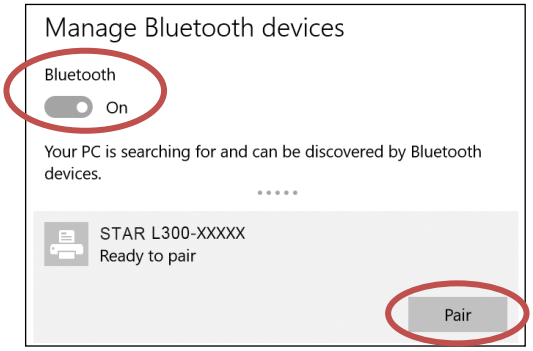
## 2.2.3 Windows10

1. Press and hold MODE button for approx. 2 seconds, and printer is turned on.
2. Open SETTINGS , select [Devices] - [Bluetooth].

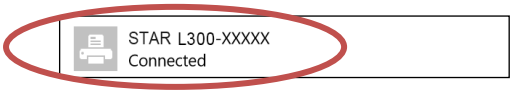



3. Turn ON Bluetooth.

   Select the displayed device name (STAR L300-XXXXX), and enter the PIN code.




4. When "Connected" is displayed, pairing is completed.




***You can test the connectivity with a host device by using Star IO SDK Application which is available on Apple Store and Google play.***

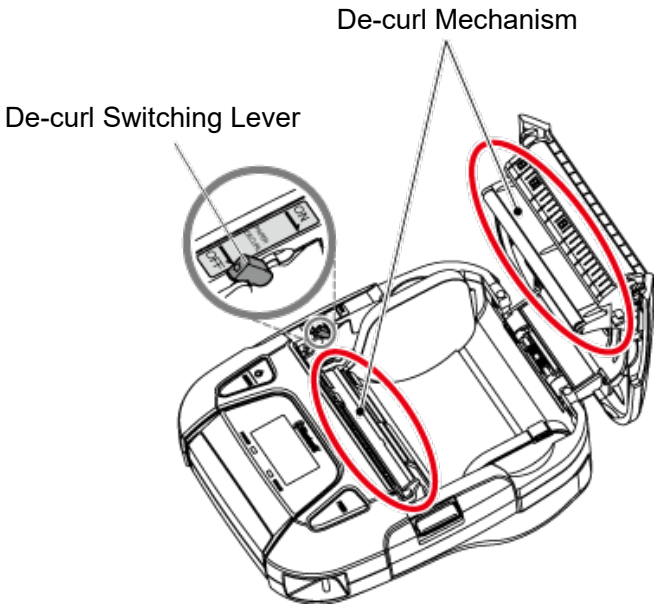
# 2.3 Loading Paper

## 2.3.1 De-curl Setting

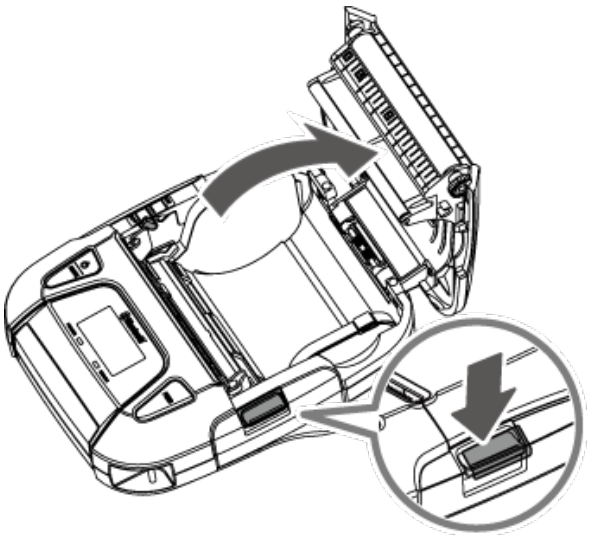
This function makes it possible to correct the curl in the thermal paper roll.

It can set ON or OFF by De-curl Switching Lever. (*Default: OFF)

***NOTE: Be careful not to forcibly pull or push the de-curl mechanism part. The de-curl mechanism part may become damaged if strong force is applied.***

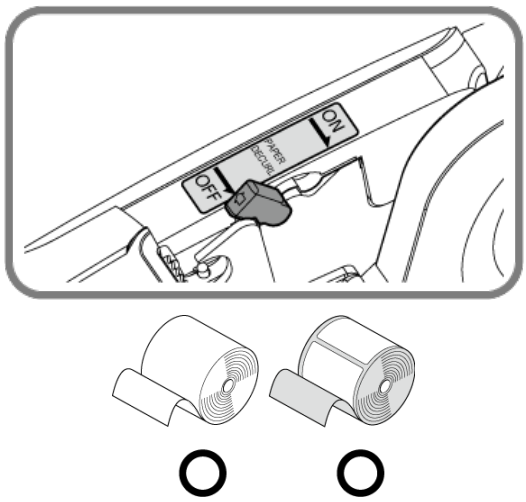



1. Press the cover open button to open the printer cover.



2. The de-curl switching lever is set to OFF by default, and you need to be set to ON if you would like to use this function.

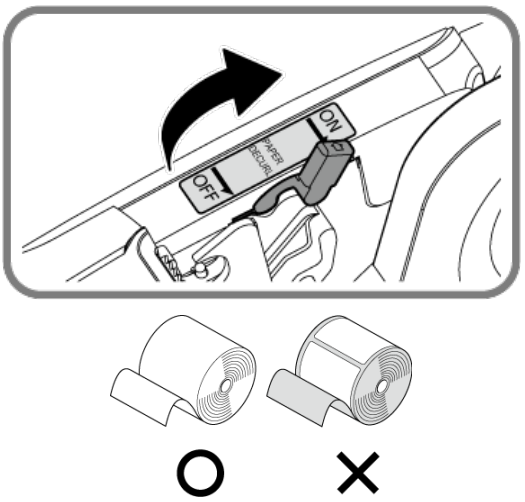
● OFF (default)






(Receipt paper/Label paper/Linerless label paper)

● ON





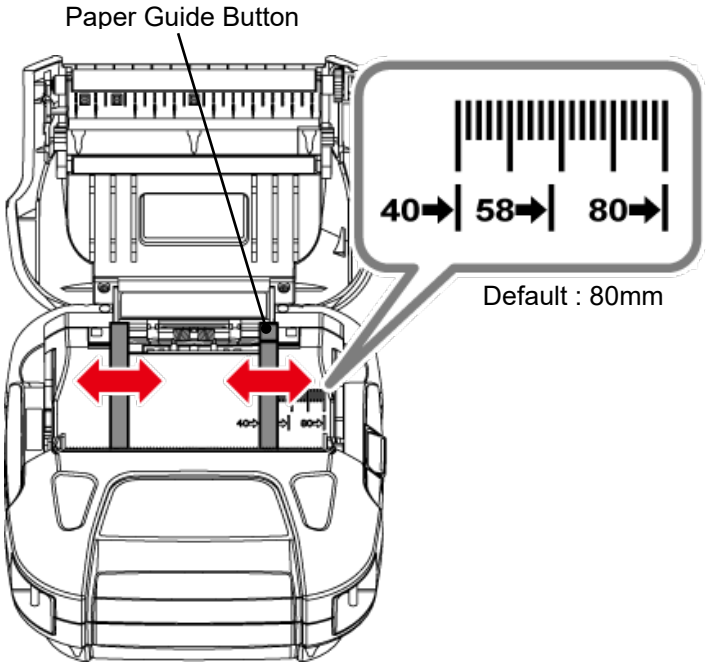

(Receipt paper only)

3. Set the de-curl switching lever to OFF when label paper or linerless label paper is used.

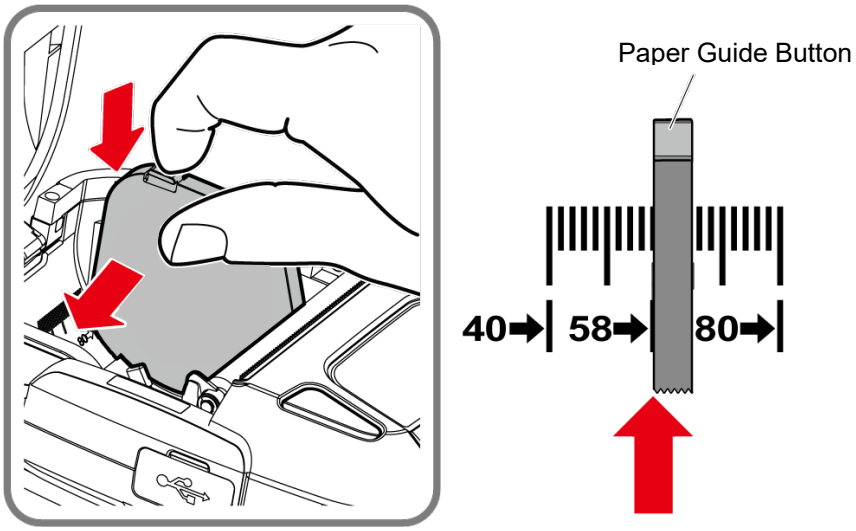
***NOTE: If the paper thickness of the receipt is out of specification, it may cause a paper feed failure. In that case, please set the de-curl switching lever to OFF.***

## 2.3.2 Paper Guide Adjustment

Press and hold the paper guide button, push the paper guide so that it can be moved to adjusted to fix the roll paper.

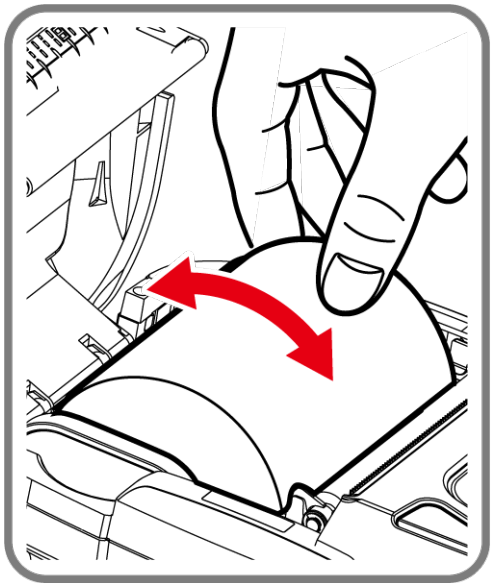



***Example:** When using the 58mm width roll paper, press and hold the paper guide button, push the paper guide to the position of 58 so that it can be fix the 58mm width roll paper.



***NOTE :***

1. ***Please be sure to adjust the paper guide position while pressing the paper guide button. Moving the paper guide without pressing the paper guide button may damage it.***
2. ***The paper guide position can be adjusted at 2 mm pitch.***
   ***Move the paper guide until it touches the roll paper.***
   ***When the paper guide is set in the proper position, the paper roll can be rotated lightly by hand.***

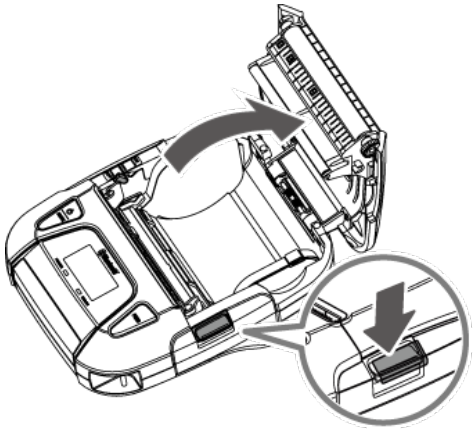


3. ***Do not change the paper width while the printer is in use.***
   ***The amount of wear on the thermal head and rubber roller varies depending on the paper width. This varying amount of wear may cause problems in printing.***

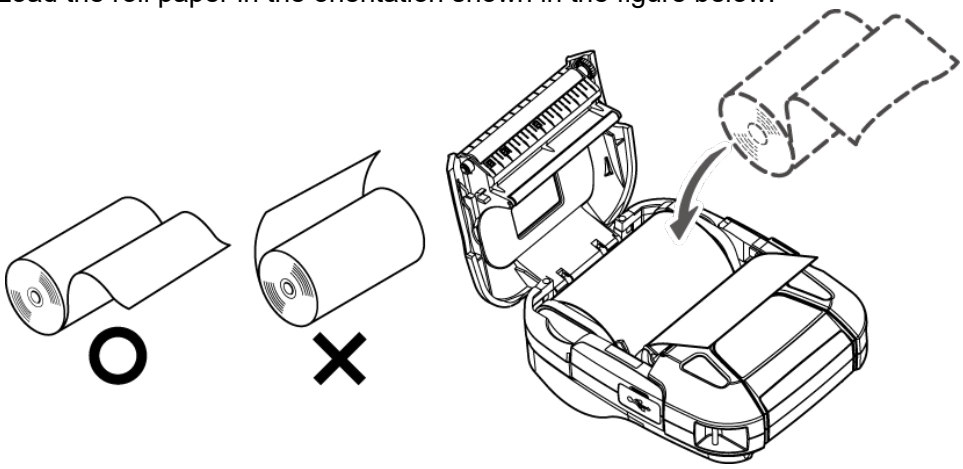
## 2.3.3 Loading Paper to the Printer

Refer to Section 5 “Paper”, to select roll paper that conforms to the specifications.

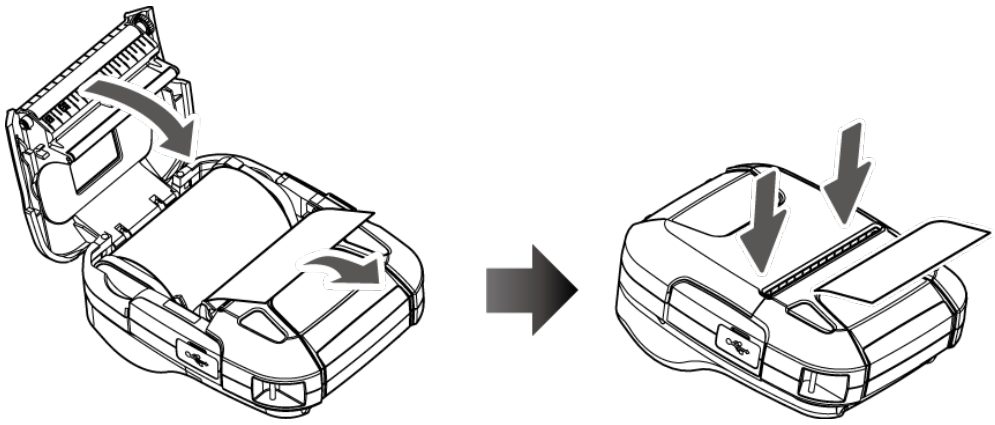
1. Press the cover open button to open the printer cover.



2. Load the roll paper in the orientation shown in the figure below.




3. Pull the edge of the roll paper straight toward this side. Then press down on both sides of the printer cover to close it firmly. After closing printer cover securely, cut any excess paper.



***NOTE: 1: If the installed roll paper is slackened, folding of right and left ends of paper or a feeding failure may occur. Setting paper guide width too wide for the paper may also cause these problems.***

***2: To avoid paper jams and other problems, feed the paper at least 1 mm (8 dot lines) before printing.***

## 2.3.4 Automatic Adjustment of Label Gap Sensor

This function is to automatically calibrate the printer setting according to label paper used.

Procedure:

1. Check the paper type if "Label" is selected.
   *Refer to "3.4 Memory Switch Settings"
2. Turn off the printer.
3. Set a label paper into the printer.
4. Hold the MODE and FEED button for self-printing, and keep holding the buttons until further label paper is fed.
5. Printer automatically calibrates the sensor and indicate the progress on the OLED screen.
6. Done.

## ⚠ *CAUTION*

***When ERROR lamp is flashing, please make sure the cover is closed correctly. If it's not, open the cover and close it correctly.***

***When the paper is jammed, be sure to open the printer cover before removing the jammed paper.***

***Do not under any circumstances try to pull out the jammed paper forcefully while the printer cover is closed, doing so may damage parts of the printer.***

# Caution Symbol

This symbol is placed near the thermal head to indicate that it may be hot. Never touch the thermal head immediately after the printer has been used. Also, even when the thermal head is not hot, do not touch it, because static electricity can damage the devices inside the thermal head.

---

## ⚠ *WARNING*

***1) Do not touch the tear bar.***

- ***There is a tear bar inside the paper outlet slot. You could neither put your hand in the paper outlet slot while printing is in progress nor put your hand into the outlet even when printing is not in progress.***
- ***The paper cover can be opened when replacing the paper. However, since the tear bar is on the inside of the paper cover, be careful not to place your face or hands too close to the tear bar.***

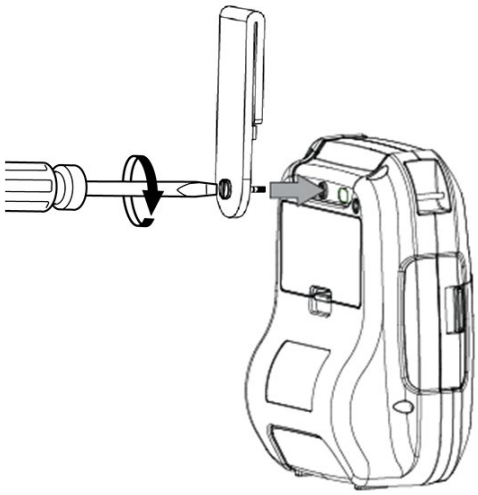
***2) During and immediately after printing, the area around the thermal head is very hot. Do not touch it, as you could be burned.***

# 2.4 Belt Clip

## 2.4.1 Attaching to the Printer

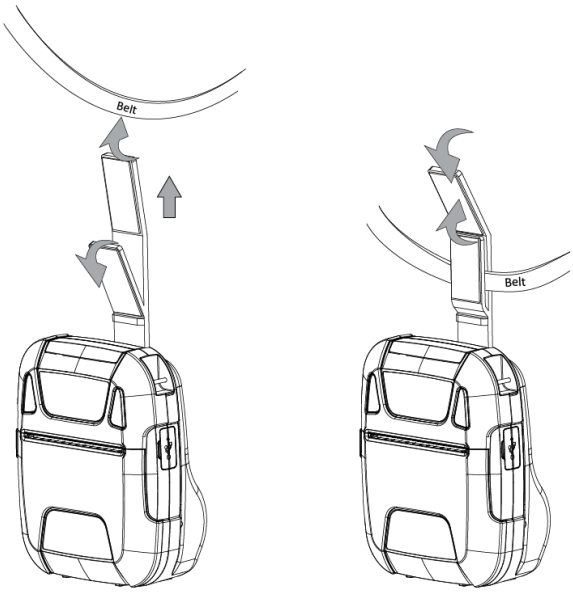
Follow the procedure below to attach the belt clip to the printer.

1. Make sure that you are attaching the belt clip in the right orientation, then turn the screw that comes with the belt clip into the designated screw hole to attach the belt clip to the printer. Use a straight slot screw driver to firmly screw in the screw hole.



## 2.4.2 Using the Belt Clip

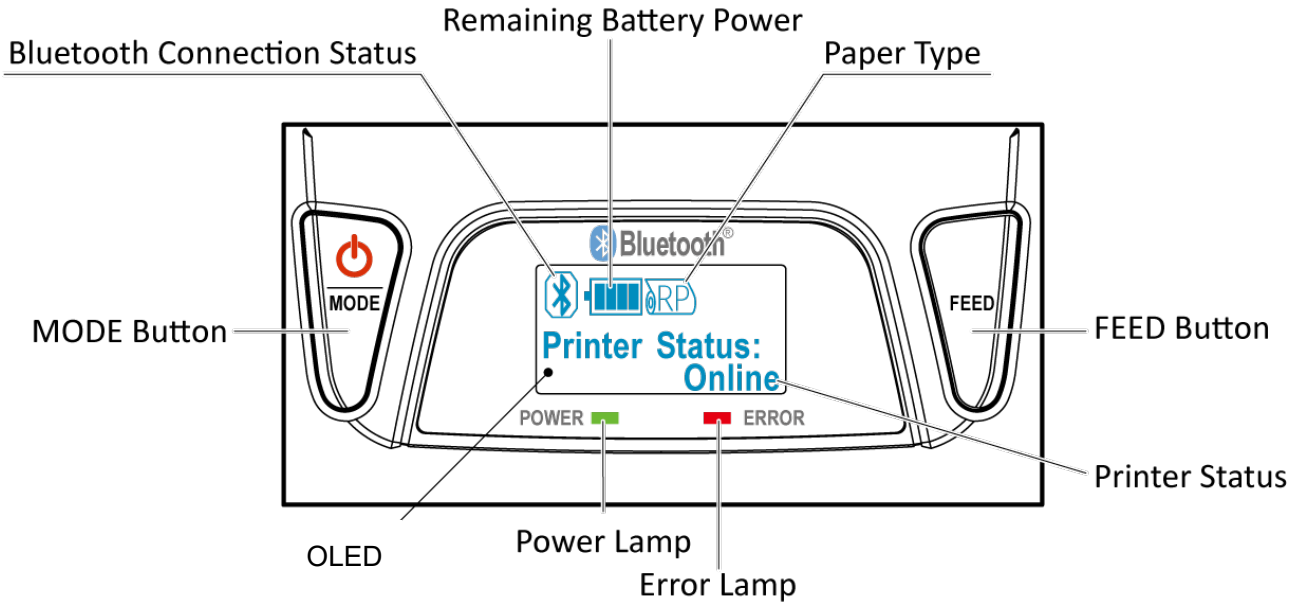
When the printer is attached to your belt, you can use it like the picture below.




***NOTE: Be careful not to drop when use a belt clip. Velcro be securely fixed.***

> ***Hold the printer firmly with your hand when you swipe a magnetic stripe card or cut paper. If it is not held firmly, you may fail to read card data or cannot cut paper smoothly with the tear bar.***

# 3. Control Panel & Buzzer




## 3.1 Button

1) MODE Button:

- Holding the MODE button for 2 seconds or more will turn the power on or off.
- In the memory switch settings mode, the MODE button is to move a cursor("_") on the list.
  If holding MODE button during setting mode it moves to previous screen.

2) FEED Button :

- When the printer is on, paper can be fed manually by pressing and holding the FEED button for more than one second.
- In the memory switch settings mode, the FEED button is to select the printer mode.
  If holding FEED button during setting mode it will define the setting.

◆ Holding MODE & FEED buttons for 5 seconds will put the printer into Memory Switch Setting mode.
(Please refer to 3.4 Memory Switch Settings for details about mode conversion.)

# 3.2 LED & OLED Display / Error

## 3.2.1 LED & OLED Display

Table1-1

<table>
<tr><th colspan="5" rowspan="2">Status</th><th colspan="2" rowspan="2">Action</th><th colspan="2">Lamp</th><th rowspan="2">OLED<br>Description</th><th rowspan="2">Buzzer</th></tr>
<tr><th>Power<br>(Green)</th><th>Error<br>(Red)</th></tr>
<tr><td colspan="5">Printer Initialization(Power On)</td><td colspan="2"></td><td>ON</td><td>OFF</td><td>[Printer Status:Online]</td><td>Beep<br>(A->B->C)</td></tr>
<tr><td rowspan="3">Power<br>OFF</td><td colspan="4">USB Cable is not connected</td><td colspan="2"></td><td>OFF</td><td>OFF</td><td>N/A</td><td rowspan="3">Beep<br>(D->E->F)</td></tr>
<tr><td colspan="3" rowspan="2">USB Cable is<br>connected</td><td colspan="2">Battery Full</td><td>ON</td><td>OFF</td><td>N/A</td></tr>
<tr><td colspan="2">Battery Empty</td><td>600ms<br>Flashing</td><td>OFF</td><td>N/A</td></tr>
<tr><td rowspan="8">On-Line<br>(Idle)</td><td colspan="3" rowspan="4">Bluetooth<br>(COM)<br><br>USB Cable is not<br>connected</td><td colspan="2">Bluetooth connected</td><td>ON</td><td>OFF</td><td>Maintain the original state<br>Bluetooth Icon ON</td><td>Nothing</td></tr>
<tr><td colspan="2">Bluetooth disconnected</td><td>ON</td><td>OFF</td><td>maintain the original state<br>Bluetooth Icon OFF</td><td>Nothing</td></tr>
<tr><td colspan="2">Stand-by</td><td>1sec<br>Flashing</td><td>OFF</td><td>N/A</td><td>Nothing</td></tr>
<tr><td colspan="2">Return from Stand-by</td><td>ON</td><td>OFF</td><td>maintain the original state</td><td>Nothing</td></tr>
<tr><td rowspan="5">USB</td><td rowspan="4">USB Cable<br>is<br>connected</td><td rowspan="2">Normal</td><td>Battery Full</td><td>ON</td><td>OFF</td><td>maintain the original state<br>Battery Icon<br>Battery Full Icon</td><td>Nothing</td></tr>
<tr><td>Battery is<br>not Full</td><td>600ms<br>Flashing</td><td>OFF</td><td>maintain the original state<br>Battery Icon<br>Charge Icon</td><td>Beep<br>(G)</td></tr>
<tr><td colspan="2">Stand-by</td><td>1sec<br>Flashing</td><td>OFF</td><td>N/A</td><td>Nothing</td></tr>
<tr><td colspan="2">Return from Stand-by</td><td>600ms<br>Flashing</td><td>OFF</td><td>maintain the original state</td><td>Nothing</td></tr>
<tr><td>Taking off<br>cable</td><td>Normal</td><td>Battery Full</td><td>ON</td><td>OFF</td><td>maintain the original state<br>Battery Icon<br>Battery Full Icon</td><td>Nothing</td></tr>
</table>

Table1-2

| Status | | | Action | Lamp | | OLED Description | Buzzer |
|---|---|---|---|---|---|---|---|
| | | | | Power (Green) | Error (Red) | | |
| On-Line (Idle) | USB | Taking off cable | Battery is not Full | 600ms Flashing =>ON | OFF | Nmaintain the original state<br>Battery Icon<br>Charge Icon | Beep (G->G->G) |
| | | | Stand-by | 1sec Flashing | OFF | N/A | Nothing |
| | | | Return from Stand-by | ON | OFF | maintain the original state | Nothing |
| | MSR Mode | | Waiting for swiping | ON | OFF | [MSR MODE...] | Nothing |
| | | | Stand-by | 1sec Flashing | OFF | N/A | Nothing |
| | | | Succeeded decoding | ON | OFF | maintain the original state | Beep (G) |
| | | | Failed decoding | ON | OFF | MSR MODE... | Beep (G->G) |
| | Receiving Data | | Printing Data (Including busy state) | ON | OFF | [Printer Status : Online] | Nothing |
| | | | Other | ON | OFF | maintain the original state | Nothing |
| Menu Operation Mode | | | Enter Menu Operation Mode | ON | OFF | [Enter Menu Mode] | Beep (G-.G-G ) |
| | | | While Menu Operation Mode | | | maintain the original state | When push the button Beep(G) |
| | | | Get out Menu Operation Mode | | | maintain the original state | Nothing |
| Self Test | Printing | | Before printing | ON | OFF | [Press Feed To Print] | Nothing |
| | | | While printing | | | [Press Feed To Print] | Nothing |
| | | | After printing | | | Self test menu | Nothing |
| | MSR | | Online | ON | OFF | [Please Swipe Card] | Nothing |
| | | | Error | ON | Flashing | [Printer not ready...]<br>→ Self test menu | Nothing |
| | | | Succeeded decoding | ON | OFF | [Please Swipe Card] | Beep (G) |
| | | | Failed decoding | | | [Please Swipe Card] | Beep (G-G) |
| | Hex Dump Mode | | | ON | OFF | [Hex Dump Mode] | Nothing |

Table1-3

| Status | Action | Lamp | | OLED Description | Buzzer |
|---|---|---|---|---|---|
| | | Power (Green) | Error (Red) | | |
| Self Test Printing at the button operation | While printing | ON | OFF | [maintain the original state] | Nothing |
| | After printing | | | maintain the original state | Nothing |
| Writing Firmware | Enter Writing Mode | ON | OFF | N/A | Nothing |
| | While Writing | | | N/A | Nothing |
| | Finish Writing | | | N/A | Nothing |

***NOTE:***

***a) Bluetooth Status icon, Battery status icon and Roll paper Status Icon are always displayed on OLED.***

***b) Buzzer sound frequency or pattern***

***A : 530Hz/192msec***

***B : 670Hz/192msec***

***C : 800Hz/192msec***

***D : 800Hz/96msec***

***E : 667Hz/96msec***

***F : 537Hz/96msec***

***G : 800Hz/96msec***

- **Bluetooth Connection Status Icon:**

| Icon | Bluetooth Status |
|---|---|
|  | No Bluetooth connection |
|  | Bluetooth connection |

➢ **Remaining Battery Power Icon:**

**No Charging**

| Icon | Battery Status and Voltage |
|---|---|
|  | Empty 7.2~7.4V<br>The remaining battery power is extremely low.<br>*Less than 7.2V Please turn off the printer |
|  | 1 bar 7.4~7.5V<br>The remaining battery power is low.<br>Please charge the battery pack |
|  | 2 bars 7.5~7.6V |
|  | 3 bars 7.6~7.9V |
|  | 4 bars 7.9~8.4V<br>There is sufficient remaining battery power. |

**While charging**

| Icon | Battery Status and Voltage |
|---|---|
|  | Charging ~8.3V |
|  | 4 bars 8.3~8.4V |

➢ **Paper Type Icon:**

| Icon | Roll Paper Status |
|---|---|
|  | With receipt paper |
|  | Without paper |
|  | Thermal paper with BM backside |
|  | Label paper with gap |

## 3.2.2 LED & OLED Display for Error

| Status | | Action | | Lamp | | OLED Description | Buzzer |
|---|---|---|---|---|---|---|---|
| | | | | Power (Green) | Error (Red) | | |
| Error | Recoverable Error *Buffer is cleared. | No paper error | Happened | ON | Flashing | [Printer Status:Out of Paper] Roll paper Icon without paper | Beep (G->G) |
| | | | Recovered | ON | OFF | [Printer Status:Online] Roll paper Icon maintain the original state | Beep (G) |
| | | Cover open error | Happened | ON | Flashing | [Printer Status:Cover Open] | Beep (G->G) |
| | | | Recovered | ON | Depend on paper Flashing or OFF | maintain the original state | Beep (G) |
| | | Black Mark Sensor error | | ON | Flashing | [Printer Status: Black Mark Error] | Beep (G->G) |
| | | Gap Sensor error (Transmissive Sensor error) | | ON | Flashing | [Printer Status: Gap Sensor Error] | Beep (G->G) |
| | Auto Recoverable Error | Heat Protection of Thermal Printer Head | Happened | ON | Flashing | [TPH Thermistor detecting] | Nothing |
| | | | Recovered | ON | OFF | [TPH Thermistor detecting] | Nothing |
| | Unrecoverable Error | MSR error | | ON | Flashing | [Printer Status: MSR Error] | Beep (G->G->G) |
| | | Black Mark Sensor Adjustment error | | ON | Flashing | [Printer Status: BM Adjust Error] | Beep (G->G->G) |
| | | Gap Sensor Adjustment error (Transmissive Sensor Adjustment error) | | ON | Flashing | [Printer Status: Gap Adjust Error] | Beep (G->G->G) |
| | | Thermal Head Thermister error | | ON | Flashing | [Printer Status: Thermal Head[Error] | Beep (G->G->G) |
| | | Printer Internal Thermister error | | ON | Flashing | [Printer Status: Printer Error] | Beep (G->G->G) |

***NOTE:***

***a) Bluetooth Status icon, Battery status icon and Roll paper Status Icon are always displayed on OLED.***

***b) Buzzer sound frequency or pattern***

| | |
|---|---|
| ***A : 530Hz/192msec*** | ***E : 667Hz/96msec*** |
| ***B : 670Hz/192msec*** | ***F : 537Hz/96msec*** |
| ***C : 800Hz/192msec*** | ***G : 800Hz/96msec*** |
| ***D : 800Hz/96msec*** | |

# 3.3 Self Test

You can use self test to check the printer’s settings.

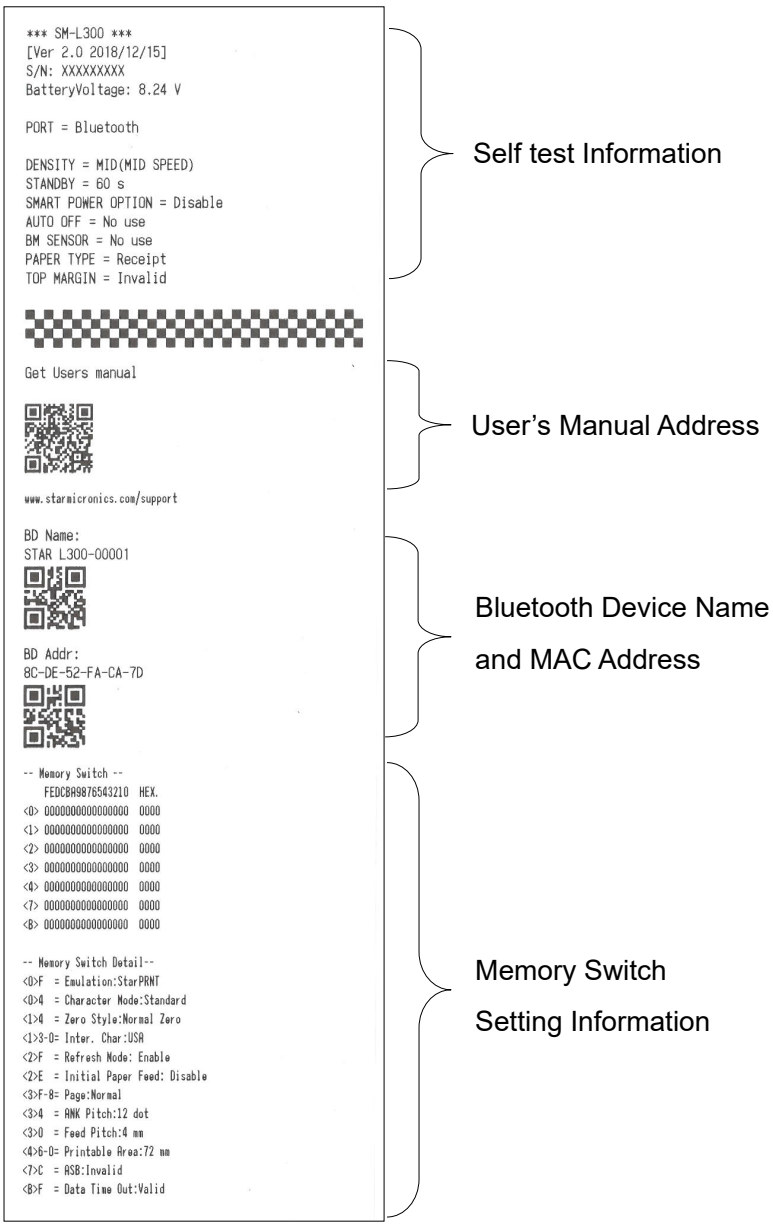
Before you start the self test, make sure that roll paper has been properly loaded into the printer.

## 3.3.1 Self Test Procedure

1) Turn on the power while holding down FEED button.
2) The printer will print the current printer status, including the firmware version, communication mode, print settings and QR code that links to the users Manual Download site.
3) The self test will finish automatically. The printer will be ready to receive data after the self test finishes.

## 3.3.2 Printing the Bluetooth Device Name and MAC Address

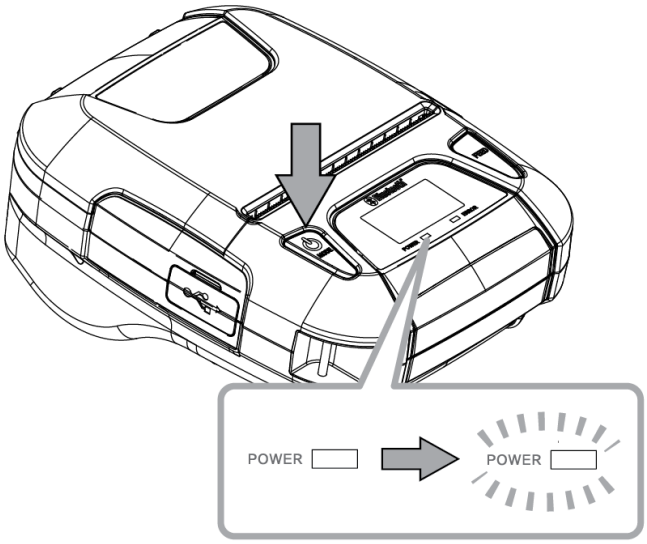
1) Follow the procedure in section 3.3.1 to perform a self test.
2) Before the self test finishes, press and hold FEED and MODE at the same time.
3) The printer will print the Bluetooth device name and MAC address.




# 3.4 Memory Switch Settings (Using Buttons On the Printer)

Change the memory switch by following operations.

1. Press and hold MODE button for approx. 2 seconds, and printer is turned on.




2. To put the printer into Memory Switch Setting mode, press and hold both the MODE & FEED buttons for 5 seconds. After printer displays “Enter Menu Mode”, you can configure the settings, release the buttons after you surely confirm the screen display “Enter Menu Mode”, to get a printer into the setting mode.
3. To switch the Menu and option parameter , or return to the previous menu, press MODE button. If holding MODE button during setting mode it moves to previous menu.
4. To move the cursor(“_”), entry the printer mode, or confirm the new setting, press FEED button. Confirms it and move to previous menu.

## ⚠ *CAUTION*

***Before changing the memory switch settings, make sure that the communication with a host device is disconnected.When the printer is under the Bluetooth communication with a host device, it cannot enter the Memory Switch Setting mode.***

# < Memory Switch Setting Table >

| First-level menu | | Second-level menu | Third-level menu | Fourth-level menu | Default |
|---|---|---|---|---|---|
| **1 Self Test** | | 1 Print | Press Feed To Print | -- | -- |
| | | 2 MSR*1 | MSR SELF TEST | Please Swipe Card | -- |
| | | 3 Hex Dump Mode | Hex Dump Mode | -- | -- |
| | | 4 Previous Menu | -- | -- | -- |
| **2 System Setting** | Input Password: 0000 | 1 Density | 0-Medium<br>1-Low<br>2-High<br>3-Special | -- | Medium |
| | | 2 Standby Time | Standby Time:<br>[0010-9999(Sec)] | -- | 60 Seconds |
| | | 3 Auto Off Time | Auto Off Time:<br>[0001-9999(Min)] | -- | 0000 |
| | | 4 Smart Power | Smart Power<br>0-Disable<br>1-Enable | -- | Disable |
| | | 5 Paper Type | 0-Receipt | -- | Receipt |
| | | | 1-Label / Sticky | Top Margin<br>0-Disable<br>[ 1-9 (mm) ] | |
| | | 6 Black Mark Sensor | 0-No Use<br>1-Use (3inch)<br>2-Use (2inch)<br>3-Use (Center)<br>4-Label (Gap) | Jump to third-level menu of Printable Area | No Use |
| | | 7 Printable Area | 0-72mm (3inch)<br>1-50.8mm (2inch) | -- | 72mm (3inch) |
| | | | 2-Other | Printable Area:<br>[30-72(mm)] | |
| | | 8 Factory Reset | 0-N<br>1-Y | -- | N |
| | | 9 Password | Input New Password:<br>[0000-9999] | -- | 0000 |
| | | 10 Previous Menu | -- | -- | -- |
| **3 Exit Menu** | | | -- | -- | -- |

*1) “2 MSR” is function of MSR model only.

**NOTE: Refer to item 3.5 to 3.9 about detail of each function.**

## 1) Self Test

▸ Long press the MODE button and release it to switch the menu item--Previous Menu.

→ Press the FEED button once to return to the previous menu.

Display: 1 Self Test
2 System Setting
3 Exit Menu


▸ Press the FEED button once to enter the menu item--Self Test.

Display: 1 Print
2 MSR
3 Hex Dump Mode
4 Previous Menu


→ Press the FEED button once, you will see present “Press Feed To Print” in the OLED, press FEED button, the new settings will be printed.

* “2 MSR” is function of MSR model only.

---

If the settings were not configured correctly, follow the above procedure to configure the settings again.

## 2) System Setting

**Example**

When you want to change the settings of the printer mode as shown below.

| Item | Factory Setting | Configuration Example |
|---|---|---|
| 1 Density | 0(Medium) | 1(Low) |
| 2 Standby Time | 0060(Sec) | 0080(Sec) |
| 3 Auto Off Time | 0(Invalid) | 1000(Min) |
| 4 Smart Power | 0(Disable) | 0(Disable) |
| 5 Paper Type | 0(Receipt) | 2(BM(2inch)) |
| 6 BM Sensor | 0-No Use | 1-Use (3inch) |
| 7 Printable Area | 0(72mm(3inch)) | 1(50.8mm (2inch)) |
| 8 Factory Reset | 0(N) | 0(N) |
| 9 Password | 0000 | 2222 |
| 10 Previous Menu | - | - |

▸ Press and hold the MODE & FEED buttons for 5 seconds.

→ You will see present “Enter Menu Mode” in the OLED.


▸ Press the MODE button once to switch the menu item.

Display: 1 Self Test →2 System Setting


▸ Press the FEED button once to get into the System Setting menu.

→ You will see present “Input Password 0000” in the OLED.

→ Press FEED button to move cursor(“_”), press MODE button to switch the number (0~9).

Password: 0000(default)

→ Press and hold the FEED button for 2 seconds to get into the menu.

Display: 1 Density

2 Standby Time

3 Auto Off Time

4 Smart Power

5 Paper Type

6 BM Sensor

7 Printable Area

8 Factory Reset

9 Password

10 Previous Menu


### 1. Density setting

▸ Press MODE button to switch the menu item, then press the FEED button once to enter the menu.

→ Press the FEED button once to get into the Density menu.

Display: Density:

0-Medium

1-Low

2-High

3-Special


0

→ Press the MODE button once to input the number 1, then press and hold FEED button to confirm the new setting and return to the previous menu.

(The density has set to Low)

0(Medium) → 1(Low)


### 2. Standby Time setting

▸ Press the MODE button once to switch the menu item--Standby Time.

→ Press the FEED button once to get into the menu.

Display: Standby Time:

[0010-9999(Sec)]

0060

→ Press the FEED button twice to move cursor(“-”), then press the MODE button twice to input the number: 8, finally press and hold FEED button to confirm the new setting and return to the previous menu.

(The standby time has set to 80 seconds)

0060(Sec) →0080(Sec)


| When set the parameter to 0000, the standby time becomes invalid.<br>If set the parameter to 0001~ 0009, a buzzer beeps, so do not set it. |
|---|

### 3. Auto Off Time setting

▸ Press the MODE button twice to switch the menu item--Auto Off Time.

→ Press the FEED button once to get into the menu.

Display: Auto Off Time:

[0000-9999(Min)]

0000


→ Press the MODE button once to input the number on : 1, then press and hold FEED button to confirm the new setting and return to previous menu.

(The auto off time has set to 1000 minutes)

0000(Min) →1000(Min)


| When set the parameter to 0000, the auto off time becomes invalid. |
|---|

### 4. Smart Power setting

▸ Press the MODE button 3 times to switch the menu item--Smart Power.

→ Press the FEED button once to get into the menu.

Display: Smart Power
0-Disable
1-Enable 0


→ Press the MODE button once to input the number on : 1, then press and hold FEED button to confirm the new setting and return to previous menu.


### 5. Paper Type setting

▸ Press the MODE button 4 times to switch the menu item--Paper Type.

→ Press the FEED button once to get into the menu.

Display: 0-Receipt
1-Label/Sticky
0


→ Press the MODE button once to input the number on. If ‘Label / Sticky’ is selected, move to another screen to input data like below.

Display: TOP Margin
Disable
[1-9 (mm)] 0


→ Press the MODE button twice to input the number:3, finally press and hold FEED button to confirm the new setting and return to the previous menu.

(The top margin has set to 3 mm)

Disable →3(mm)

**6. Black Mark Sensor**

▸ Press the MODE button 5 times to switch the menu item--Black Mark Sensor.

→ Press the FEED button once to get into the menu.

Display: 0-No Use
1-Use (3inch)
2-Use (2inch)
3-Use (Center)
4-Label (Gap)
0


→ Press the MODE button twice to input the number: 4, then press and hold FEED button to confirm the new setting and return to the previous menu.

(The paper type has set to Label (Gap))

No Use → Label (Gap)


**7. Printable Area**

▸ Press the MODE button 6 times to switch the menu item--Printable Area.

→ Press the FEED button once to get into the menu.

Display: 0-72mm (3inch)
1-50.8mm (2inch)
2-Other 0


→ Press the MODE button once to input the number 1, then press and hold FEED button to confirm the new setting and return to the previous menu.

(The printable area has set to 50.8mm (2inch))

72mm(3inch)→ 50.8mm(2inch)

### 8. Factory Reset

▸ Press the MODE button 7 times to switch the menu item--Factory Reset.

→ Press the FEED button once to get into the menu.

Display: 0-N

1-Y

0


→ When the setting does not need to be reset, press and hold FEED button to return to the previous menu.

### 9. Password setting

▸ Press the MODE button 8 times to switch the menu item--Password.

→ Press the FEED button once to get into the menu.

Display: Input New

Password:

0000


→ Press the MODE button twice to input the number: 2, then press FEED button once to move cursor (“-”), press the MODE button twice to input the number: 2, repeat the above steps to input the number “2222”, finally press and hold FEED button to confirm the new setting and return to the previous menu.

(The Password has set to 2222)

0000→2222


### 10. Select Previous Menu

▸ Long press the MODE button and release it to switch the menu item--Previous Menu.

→ Press the FEED button once, then it will returns to the previous menu.

# 3.5 Hex Dump Mode

All data sent from a host device is printed by hexadecimal codes.

This mode can be used to check if a program to be sent to the printer is coded correctly.

**Example**

---

- Press and hold the MODE & FEED buttons for 5 seconds.

→You will see present “Enter Menu Mode” in the OLED.

- Press the FEED button once to enter the menu item--Self Test.

Display: 1 Print
2 MSR
3 Hex Dump Mode
4 Previous Menu

- Press the MODE button 3 times to switch the menu item--Hex Dump Mode.

→Press the FEED button once, you will see present “Hex Dump Mode” in the OLED.

* “2 MSR” is function of MSR model only.

NOTE: It will be limitations such as it cannot return the status.

# 3.6 Instruction for Power Management

The printer in the Standby (Sleep) Mode will recover to the Print Ready Mode when receiving print data or button operations.
Press the FEED button or the MODE button and confirm that the Power lamp (Green LED) is turned on. When the Power lamp is not turned on, it is possible that the printer is turned off by the Power OFF mode. In this case, turn the printer on manually.

## 3.6.1 Standby Time

Display on OLED is disappeared when a setting time has passed.(0010-9999 sec)

## 3.6.2 Auto-Off Time

The power  is turn off when a setting time has passed.(0001-9999 min)

## 3.6.3 Smart Power Option

The smart power option is a function to turn on the printer when it is supplied the power.

When the printer is turned off, upon being powered, it will automatically turn on.

Please press and hold the MODE button to turn off the printer when it is supplied the power.

<If AUTO OFF is enabled>

If the smart power option is enabled and printer is turned on and powered, AUTO OFF function will

be disabled.

In this case, AUTO OFF function will be enabled after power is

interrupted. For instance, if AUTO OFF is set to 10 minutes and,
The smart power option enabled, printer turned on and powered, then printer will NOT be turned off after 10 minutes.
The smart power option enabled, printer turned on and NOT powered, then printer will be turned off after 10 minutes.

| Status \ Event | | Event1 | Event2 | Event3 | Event4 |
|---|---|---|---|---|---|
| | | Powered | Powered Interrupted | Auto Power OFF Time out | Charging completed |
| Condition 1 | Turned OFF No charging | Turn ON (Auto) Start charging | N/A | N/A | N/A |
| Condition 2 | Turned OFF Charging | N/A | Turn OFF No charging | N/A | Turn OFF Charging |
| Condition 3 | Turned ON No charging | Turn ON (Auto) Start charging | N/A | Turn OFF No charging | N/A |
| Condition 4 | Turned ON Charging | N/A | Turn ON No charging | Turn ON Charging | Turn ON Charging |

# 3.7 Paper Type

Please choose proper paper type option in your uses.

0-Receipt

1-Label / Sticky

If ‘Label / Sticky’ is selected, move to another screen to input data for Top Margin.

* If ‘Receipt Paper’ is selected, Top Margin function is invalid.

Top Margin:

This sets the top margin from the cutting position (the head of the label in case of label printing) to the print start position.

0-Disable

[1 - 9 (mm)] _

If ‘Disable’ is selected, the top margin is set to the default value (8.2 mm).

# 3.8 Black Mark Sensor

When using black mark paper or label paper, set the sensor position suitable for the paper.

0-No Use - For normal Receipts paper and Linerless label paper

1-Use (3inch) - For BM paper which BM is put at the 3 inch width on back of paper

2-Use (2inch) - For BM paper which BM is put at the 2 inch width on back of paper

3-Use (Center) - For BM paper which BM is put at the center on back of paper

4-Label (Gap) - For the Label paper which can be peeled off individually and there is a gap between each labels.

*Refer to chapter 5 for paper specification.

After specifying Paper Type, move automatically to "7 Printable Area" on the printer mode setting list.

*Refer to Page 34.

# 3.9 Printable Area

Please choose proper printable area in your uses.

0-72mm (3inch) - For 3 inch paper width
1-50.8mm (2inch) - For 2 inch paper width
2-Other 0 - For other paper width or need to customize for special setting

If "2-Other" is selected, move to another screen to input data like below.
Printable Area:
[30 - 72 (mm)] _ _

Please set the actual data in your uses.
*If the data has been set on Printable Area setting before, the data is displayed the last previous set data. (If the data has never set, the data is displayed 72.)

When holding “FEED” button, data will be determined and move to "7 Printable Area" on the printer mode setting list. When holding “MODE” button, move to "7 Printable Area" without setting on the printer mode setting list.
If input data is out of range, beep the buzzer and return data to former value.

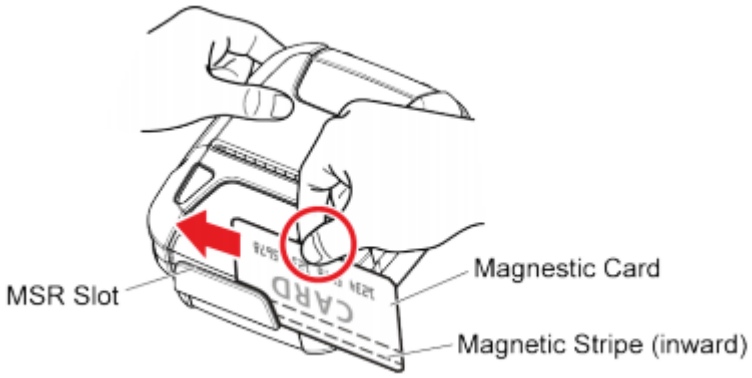
# 4. Magnetic Card Reader (For MSR model)

**Please keep the following points in mind when reading a card.**

- Swipe the card with its magnetic stripe side towards the printer.
- Hold the card in the center and swipe it straight at a steady speed in the directions of arrows. You can swipe the card in either direction to read the data.
  Be sure to hold the printer firmly with your hand while swiping.

> ➢ *Pay attention to the hand you hold the printer, you finger should not touch the cover of the MSR slot, if not, the card cannot be read properly. (See correct example on figure below)*

If you hold the corner of the card, it is difficult to swipe it straight so that you may fail to read the card data. So hold the card in the center when you swipe the card.




- A buzzer will sound once when a card is successfully read, and you will see present “MSR read success” in the OLED.
- When the printer fails to read the card, the buzzer will sound three times and you will see present ”MSR read failure” in the OLED. Please check the orientation of the card, and slide it through the reader slot again.

***NOTE:***

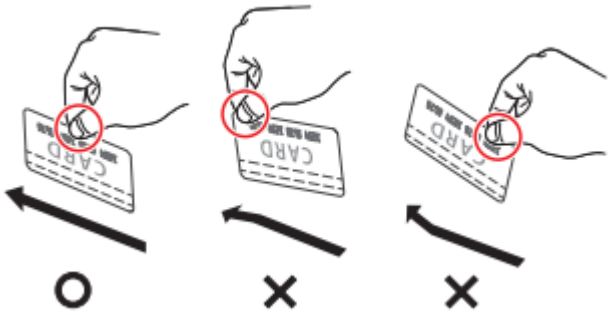
1. ***Swiping JIS card is also under MSR mode.***
2. ***JIS card operation is same as MSR card operation.***

## ■ Correct example:

Make sure the magnetic stripe is towards to the magnetic head. Hold the card in the center as left figure and swipe it straight at a steady speed in the direction of arrows.

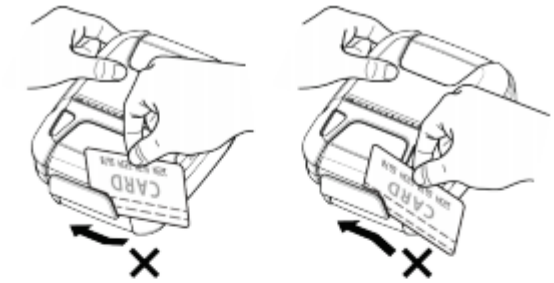
## Incorrect example:

### To grasp a magnetic card

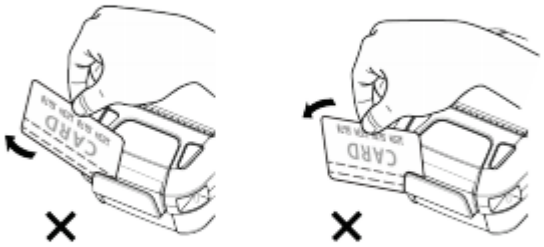


If you grasp the front/rear part of a card and move it through the MSR slot, the front /rear part is loose and a read error occurs.

### To move a magnetic card



If you grasp the front/rear part of a card and move it through the MSR slot, the front /rear part is loose and a read error occurs.



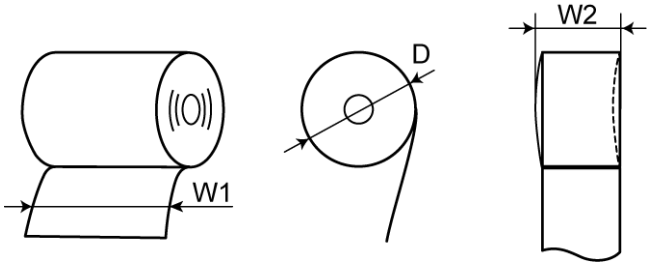
If you extract a card at the end of the MSR slot by lifting up or lowering down,the card is not maintained and a read error occurs.

If you insert a card into the middle part of the MSR card ,the card is not read correctly and read error occurs,or if you move the card back or forth by force after inserting into the MSR slot,the card is not read correctly and a read error occurs.

# 5. Paper

## 5.1 Paper Specification

### 5.1.1 Receipt (thermal) Paper




| | |
|---|---|
| Paper Width (W1) | 39.5±0.5mm to 79.5±0.5mm (2mm pitch) |
| Paper Thickness | 53µm to 85µm |
| Recording side | Outside of roll |
| Maximum Roll Diameter (D) | Ø57 mm |
| Curling dimension (W2) | 40+0.5-1 to 80+0.5-1 mm |
| Axial | Inner diameter Ø12±1 mm |
| | Outer diameter Ø18±1 mm |

***NOTE: Do not use roll paper whose end is glued to its core or end is folded at its core, because the printer will be unable to properly detect the end of the paper. Also, we recommend that you use roll paper that has a roll end mark at its end.***

**(1)Operating**

a) Temperature : 0 to 50 degrees

b) Humidity : 20 to 85 % RH (Must be no condensation)

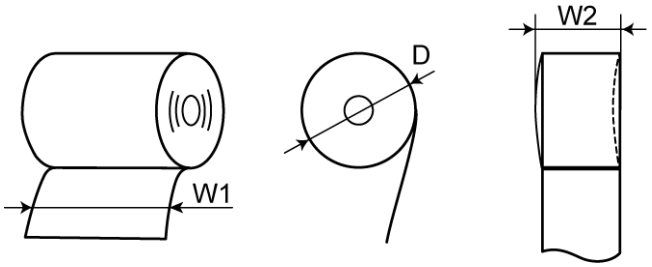
*1 The combination of 50 degrees and 85% RH (No condensation) is considered the worst value regarding high temperature and humidity. A higher humidity level higher than 80% combined with a higher temperature can cause a problem if over a prolonged period of time (more than 4 hours).

**(2) Recommended Paper**

| Manufacturer | Product Name | Recommended density |
|---|---|---|
| Mitsubishi Paper Mills Limited | P220AG | MID |
| Appvion, Inc | Alpha 400-2.1 | MID |
| Oji Paper Co., Ltd. | FD200 | MID |
| Oji Paper Co., Ltd. | PD160R-63 | MID |
| Oji Paper Co., Ltd. | PD450 | MID |

***NOTE: Please use the recommended thermal paper or same quality paper, otherwise it will influence the printing quality and decrease the thermal print head life.Some types of the paper are not suitable for use of other than the recommended print density settings.***

## 5.1.2 Label Paper




| | | |
|---|---|---|
| Paper Width (W1) | 39.5±0.5mm to 79.5±0.5mm (2mm pitch) | |
| Paper Thickness | Max. 150μm | |
| Recording side | Outside of roll | |
| Maximum Roll Diameter (D) | Ø57 mm | |
| Curling dimension (W2) | 40+0.5-1 to 80+0.5-1 mm | |
| Axial | Inner diameter | Min Ø25.4±1 |
| | Outer diameter | Min Ø30±1 |

***NOTE: Do not use roll paper whose end is glued to its core or end is folded at its core, because the printer will be unable to properly detect the end of the paper. Also, we recommend that you use roll paper that has a roll end mark at its end.***

**(1)Operating**

a) Temperature : 0 to 50 degrees

b) Humidity : 20 to 85 % RH (Must be no condensation)

*1 The combination of 50 degrees and 85% RH (No condensation) is considered the worst value regarding high temperature and humidity. A higher humidity level higher than 80% combined with a higher temperature can cause a problem if over a prolonged period of time (more than 4 hours).

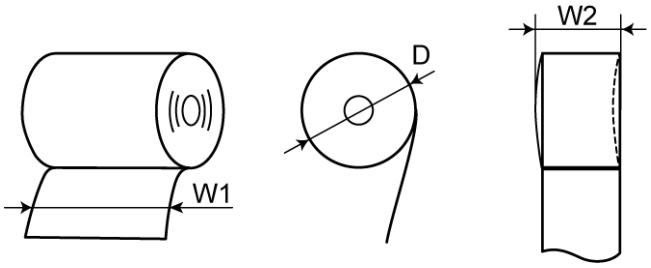
**(2) Recommended Paper**

| Manufacturer | Product Name | Recommended density |
|---|---|---|
| RICOH | 150PSMW | High |
| UPM | DT80W | MID |

***NOTE***

1. ***Please use the recommended thermal paper or same quality paper, otherwise it will influence the printing quality and decrease the thermal print head life.***
   ***Some types of the paper are not suitable for use of other than the recommended print density settings.***
2. ***When these paper are manufactured, since the end of paper of roll might be fixed by tape with core, the printer might not be able to complete printing properly.***

## 5.1.3 Linerless Label Paper




| | | |
|---|---|---|
| Paper Width (W1) | 39.5±0.5mm to 79.5±0.5mm (2mm pitch) | |
| Paper Thickness | 86µm | |
| Recording side | Outside of roll | |
| Maximum Roll Diameter (D) | Ø57 mm | |
| Curling dimension (W2) | 40+0.5-1 to 80+0.5-1 mm | |
| Axial | Inner diameter | Min Ø12.7±1 |
| | Outer diameter | Min Ø18±1 |

**(1)Operating**

a) Temperature : 0 to 45 degrees

b) Humidity : 20 to 80 % RH (Must be no condensation)

*1 The combination of 45 degrees and 80% RH (No condensation) is considered the worst value regarding high temperature and humidity. A higher humidity level higher than 80% combined with a higher temperature can cause a problem if over a prolonged period of time (more than 4 hours).

**(2)Transport / Storage**

a) Temperature : 0 to 30 degrees

b) Humidity : 45 to 65 % RH (No condensation)

*1 This is a recommended storage range for temperature and humidity.
However, the storage condition could be the same as the operating condition provided the recommended humidity level is not exceeded over a prolonged period of time (more than 4 hours).
If the storage condition does exceed the 4 hour period at the higher temperature/humidity condition, we would recommend the rolls be in operating ambient conditions for two hours to acclimate to the normal operating range.

### (3) Recommended Paper

| Manufacturer | Product Name | Recommended density |
|---|---|---|
| MAXStick | MAXStick PLUSD | High |

***NOTE: Perform cleaning regularly so that the printer can be used safely and comfortably. (Every time when a paper roll is ended.)***
***Since it is a special thermal paper with glue, there will be some irregular things appened as following: (*However, it is not a printer defect)***
***- Void printing***
***- When a roll paper reaches the end, the printer might not be able to complete printing properly due to glue.***
***- etc.***
***Please refer to the "Maintenance for using Linerless Label Paper".***

---

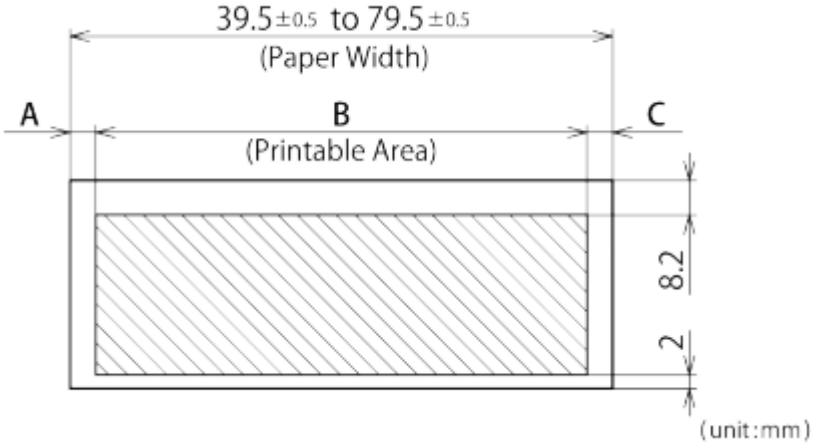
### ⚠ *CAUTION*

***1) Do not use roll paper whose end is glued to its core, because the printer will be unable to properly detect the end of the paper. Also, we recommend that you use roll paper that has a roll end mark at its end.***
***2) Chemicals and oil may cause the roll paper to change color or cause the printed characters to become lighter.***
***3) Please be aware that the roll paper can be affected by heat, humidity, and direct sunlight.***
***4) The roll paper may change color if you scratch it with your fingernail, a hard piece of metal, etc.***
***5) Please use Star recommended label paper. A label paper or receipt (thermal) paper whose end has been glued by tape or adhesive to the core may result in the printer being unable to properly detect the end of the paper or may cause damage to the mechanism, voiding the warranty.***

# 5.2 Printable Area

***NOTE: To avoid paper jams and other problems, feed the paper at least 1 mm (8 dot lines) before printing.***

## 5.2.1 Receipt (thermal) Paper



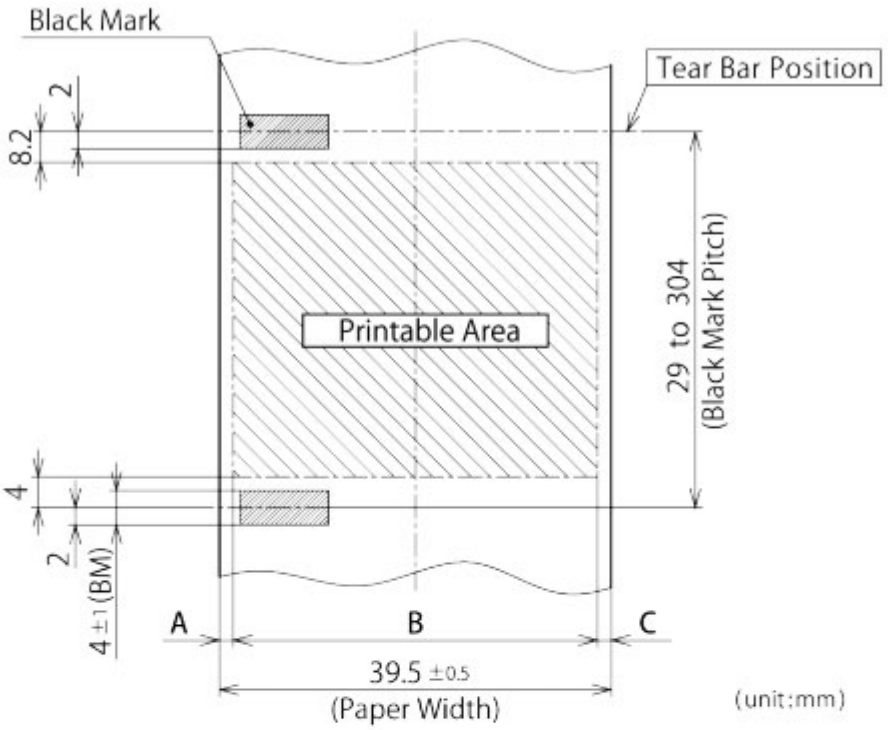

| Paper Width | A<br>Left Margin | B<br>Printable Area | C<br>Right Margin |
|---|---|---|---|
| 39.5mm to 79.5mm | 3.75mm | 32mm or 72mm | 3.75mm |
| Minimum Printable Region (39.5mm) | 4.75mm | 30mm | 4.75mm |

Printable area and Margin set by panel operation.

| | Paper Width | A<br>Left Margin | B<br>Printable Area | C<br>Right Margin |
|---|---|---|---|---|
| 72mm (3 inch) | 79.5mm | 3.75mm | 72mm | 3.75mm |
| 50.8mm (2inch) | 57.5mm | 3.38mm | 50.75mm | 3.38mm |

***NOTE: Please refer to "3.9 Printable Area" about detail of setting.***

**●Printable area of BM specification**




| Paper Width | A<br>Left Margin | B<br>Printable Area | C<br>Right Margin |
|---|---|---|---|
| 39.5mm to 79.5mm | 3.75mm | 32mm or 72mm | 3.75mm |
| Minimum Printable Region (39.5mm) | 4.75mm | 30mm | 4.75mm |

Printable area and Margin set by panel operation.

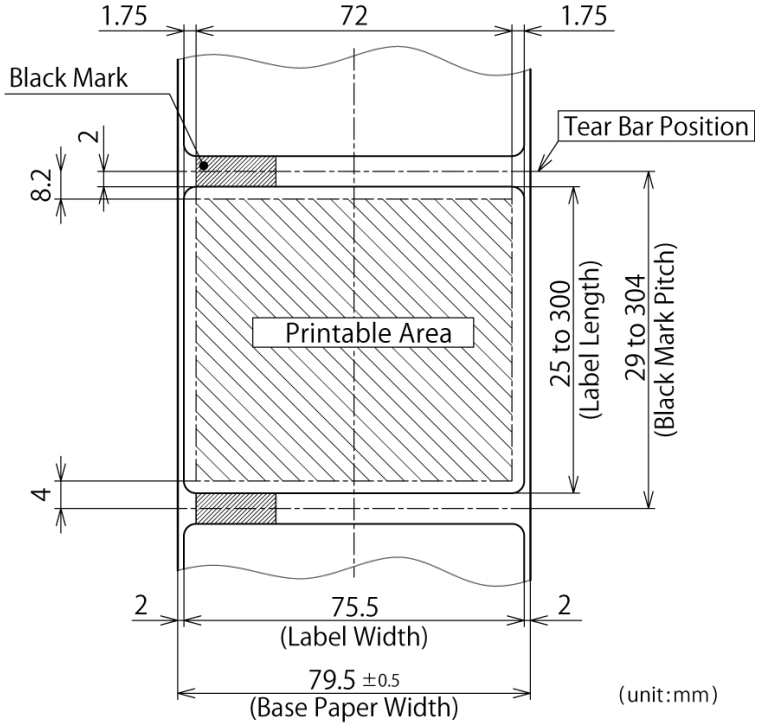
| | Paper Width | A<br>Left Margin | B<br>Printable Area | C<br>Right Margin |
|---|---|---|---|---|
| 72mm (3 inch) | 79.5mm | 3.75mm | 72mm | 3.75mm |
| 50.8mm (2inch) | 57.5mm | 3.38mm | 50.75mm | 3.38mm |

***NOTE: Please refer to "3.9 Printable Area" about detail of setting.***

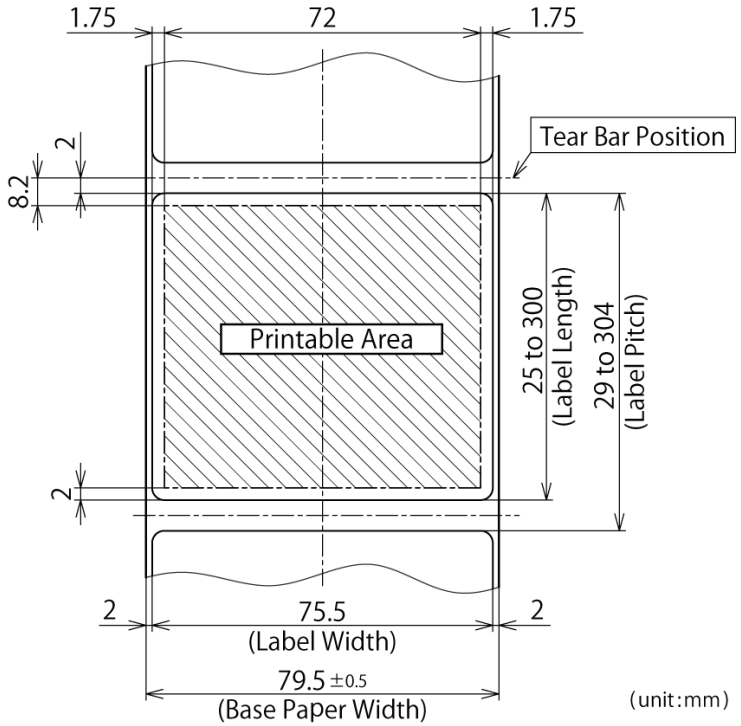
## 5.2.2 Label Paper

Label paper can be used in BM mode and Label mode.

**●When the BM mode**




**●When the Label mode**

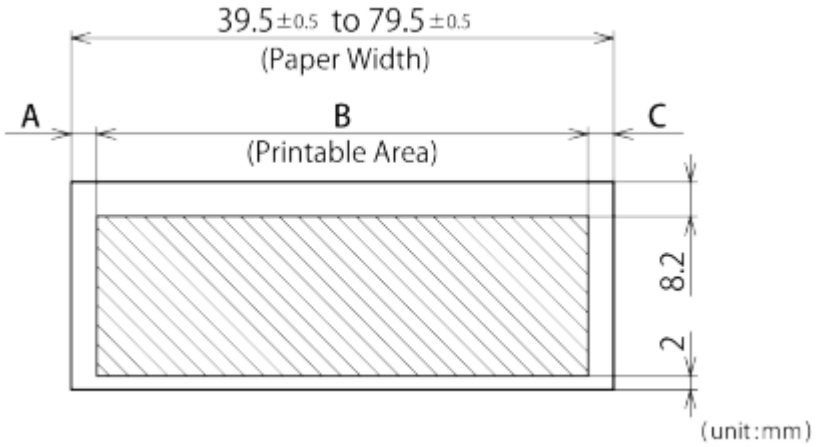



***NOTE:***

***1. When using label paper , adequately check operations on the actual layout and print media.***

***2. Please refer to "3.9 Printable Area" about detail of setting.***

## 5.2.3 Linerless Label Paper




| Paper Width | A<br>Left Margin | B<br>Printable Area | C<br>Right Margin |
|---|---|---|---|
| 39.5mm to 79.5mm | 3.75mm | 32mm or 72mm | 3.75mm |
| Minimum Printable Region (39.5mm) | 4.75mm | 30mm | 4.75mm |

Printable area and Margin set by panel operation.

| | Paper Width | A<br>Left Margin | B<br>Printable Area | C<br>Right Margin |
|---|---|---|---|---|
| 72mm (3 inch) | 79.5mm | 3.75mm | 72mm | 3.75mm |
| 50.8mm (2inch) | 57.5mm | 3.38mm | 50.75mm | 3.38mm |

***NOTE: Please refer to "3.9 Printable Area" about detail of setting.***

# 5.3 Specification of Black Mark

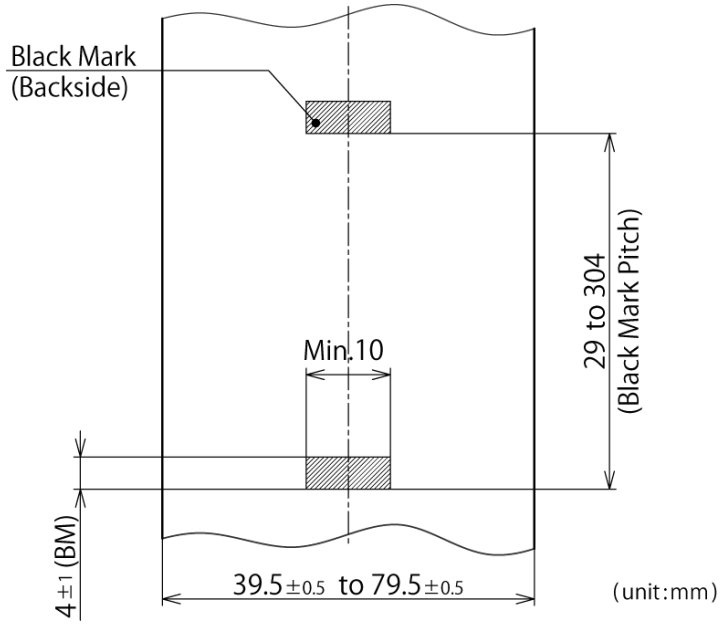
SM-L300 supports black mark on back sides of the paper and the specification of black mark is illustrated by the following image.

***NOTE:*** ***1. There is a possibility of Black Mark malfunction. Please contact the dealer when you would like to preprint paper.***

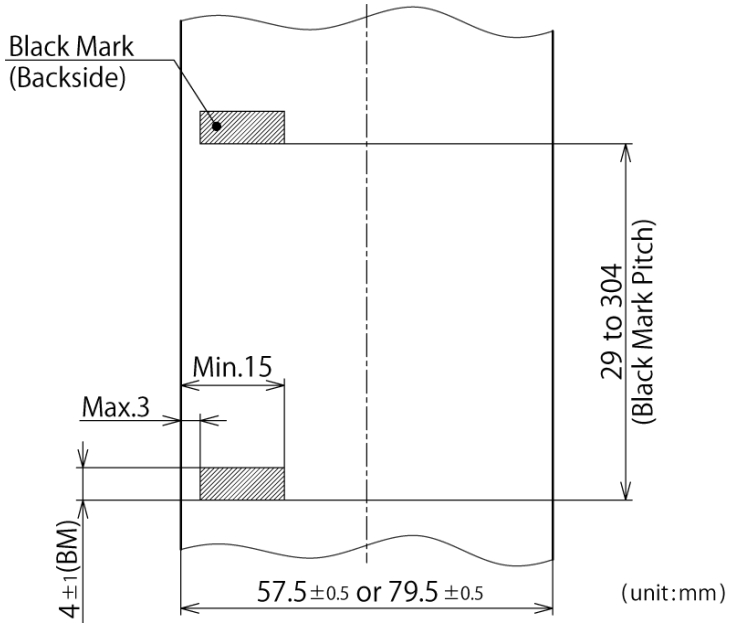
***2. The left side of black mark sensor is also supported in case of the special paper.***

***3. Black Mark Density : Black mark of Minimum 0.8 PCS.***

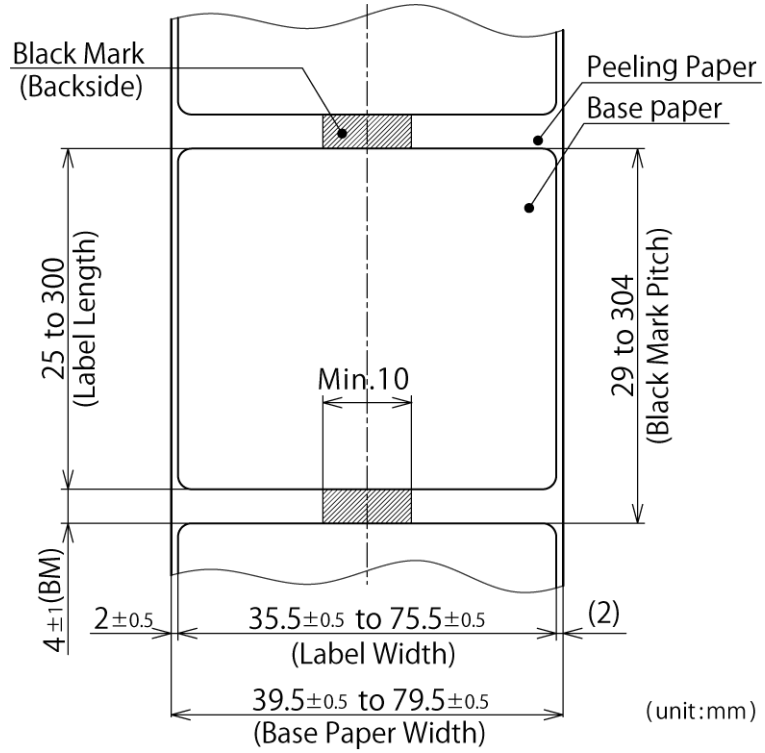
## 5.3.1 Receipt (thermal) Paper



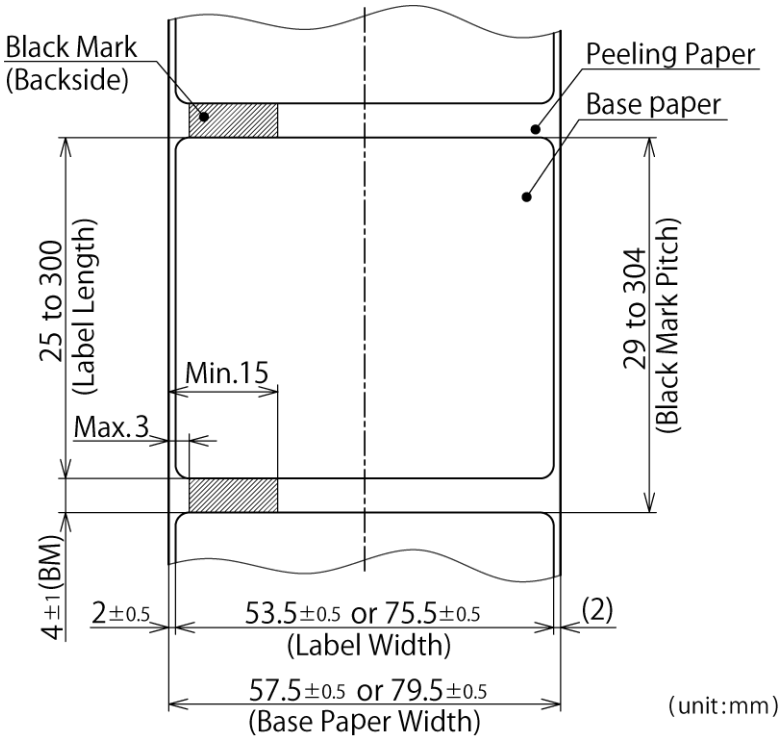

**● 58 or 80 mm width only**



## 5.3.2 Label Paper

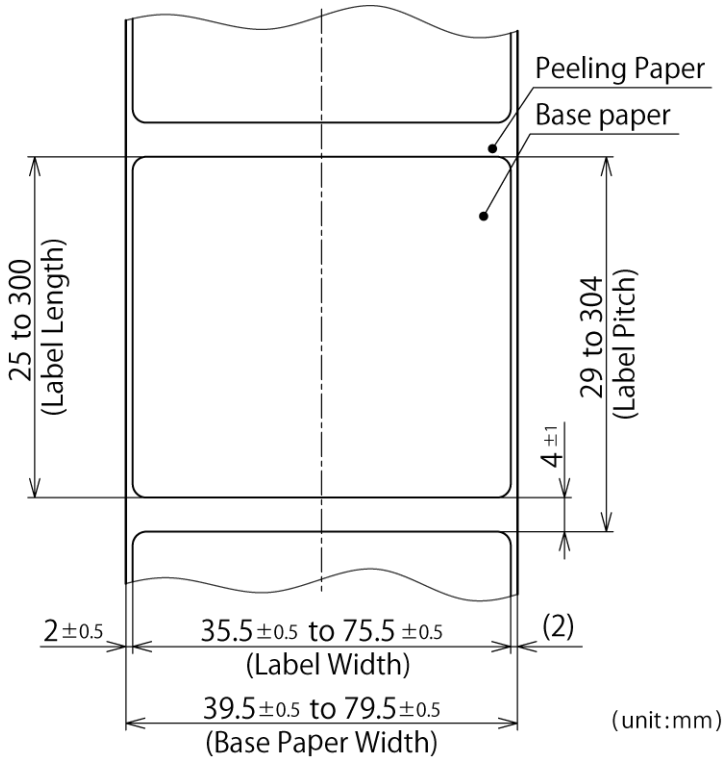



**● 58 or 80 mm width only**



# 5.4 Specifications of Label Paper

### Label Gap Variability



# 6. General Specification

Table 6-1

| Item | | Specifications | |
|---|---|---|---|
| Printing | Printing Method | Direct line thermal printing | |
| | Resolution | 203dpi (8dots/mm) | |
| | Printing Speed | Max.65mm/s | |
| | Valid Printing Width | Max.72mm | |
| Interface | Bluetooth Specification | Communication | Bluetooth Ver 3.0/4.0 [BLE] Dual Mode |
| | | Frequency Range | 2.4GHz ISM-band |
| | | Data Transmission Rate | 115200bps adjustable |
| | | Data Bit | 8 data bit fixed |
| | | Parity Bit | No parity fixed |
| | | Stop Bit | 1 stop bit fixed |
| | | SSP | Compatible |
| | USB | Micro-USB | |
| Power Saving | Stand-by | YES | |
| Character Set | Font | Alphanumeric: 9x17, 9x24, 12x24 dots<br>Kanji: 24x24 dots | |
| Barcode Symbologies | 1D | UPC-A, UPC-E, JAN/EAN8, JAN/EAN13, CODE39, ITF, CODE128, CODE93, CODABAR(NW-7), GS1-128, GS1 Omnidirectional, GS1 Truncated, GS1 Limited, GS1 Expanded | |
| | 2D | QR code(Support 15mm), PDF417, GS1 Stacked, GS1 Stacked Omnidirectional, GS1 Expanded Stacked, GS1 Composite Symbols | |
| Graphics | | Support bitmap printing with different density and user defined bitmap printing (Max. 512K for total) | |
| Detection | Sensors | Cover open sensor, Paper end sensor, Black mark sensor, Transmissive sensor(Label Gap sensor), Thermal head thermister, Printer internal thermister | |
| LED | Power Lamp | Green | |
| | Error Lamp | Red | |
| Drop resistance | | 1.2m | |

Table 6-2

| Item | | Specifications |
|---|---|---|
| Charging | | DC 5V ⎓ 1.0A(Max),<br>*Time required for full charge: Around 5 hours |
| Power Supply | Battery | 2000mA 7.4V rechargeable battery pack |
| | Battery Operating Time | Approximately 43 hours printing (12 receipts per hour with sleep mode) |
| OLED | | 128 x 64 dots |
| MSR (Single Head) MSR model only | Format | ISO 7810, ISO 7811, ISO7812 1st, 2nd and 3rd Track/ JISII Track Reading |
| | Security | AES or 3DES encryption. DUKPT Key Management |
| Enviromental Requirements *1 | Operating Condition | 0°C to 50°C, 20% to 85%RH (no condensation)<br>The combination of 40°C and 85% RH (No condensation) is considered the worst value regarding high temperatures and humidity. |
| | Charging Condition | 0°C to 45°C, 20% to 85%RH (No condensation)<br>(0～10°C: Max. 0.5 A (Recommendation) *2 |
| | Storage Condition | -20°C to 60°C, 5% to 90%RH (no condensation)<br>The combination of 40°C and 90% RH (No condensation) is considered the worst value regarding high temperatures and humidity. |
| Physical Characteristics | Dimension | SM-L300:119.1(W) x 146.4(H) x 69.0(D) mm<br>SM-L304:119.1(W) x 150.8(H) x 69.0(D) mm |
| | Weight | SM-L300:540g (including battery pack)<br>SM-L304:552g (including battery pack) |
| Reliability | TPH | 50km(not more than 12.5% printing density)/100 million pulses (Linerless = 10 km) |
| Software | Emulation | StarPRNT mode |

***1) Please refer to 5.1 for the linerless label paper.**

***2) When the printer is used in a low temperature environment(less than 10 degrees), the battery's performance will be diminished, and the amount of time that you can use the printer for may be reduced.**

***NOTE:***

1. ***The periodic maintenance is required for use of linerless label paper.***
2. ***The barcode print quality largely depends on the color characteristics of the thermal paper, the environment (such as temperature and humidity) of the printer location, the print density.***
3. ***When you read the printed barcodes using a scanner or other type of device, it is strongly recommended that you evaluate the data scanning quality beforehand.***

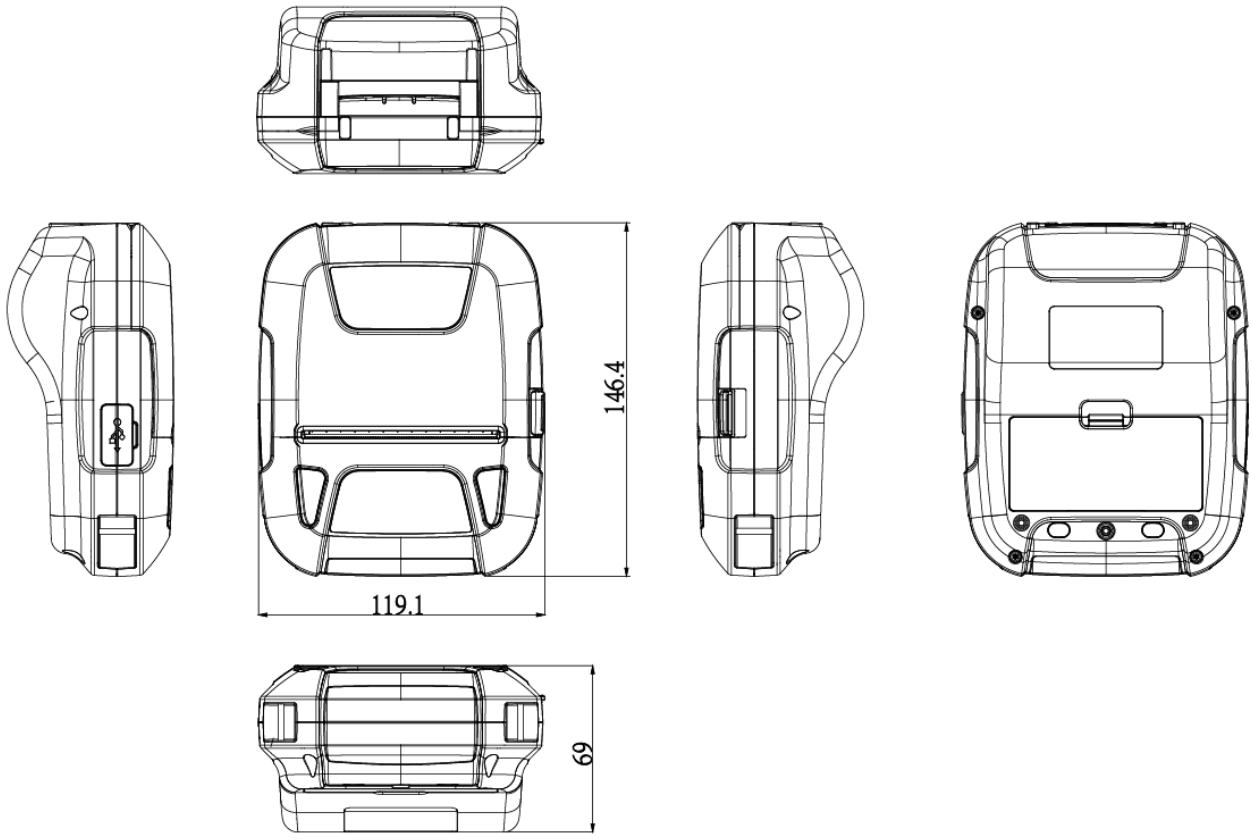
# ■ Dimensions

## ➢ SM-L300

・External Dimension: 119.1mm (W) x 146.4mm(H) x 69.0mm (D)

・Weight : 540g (including battery pack)

・Body Color : Gray and black

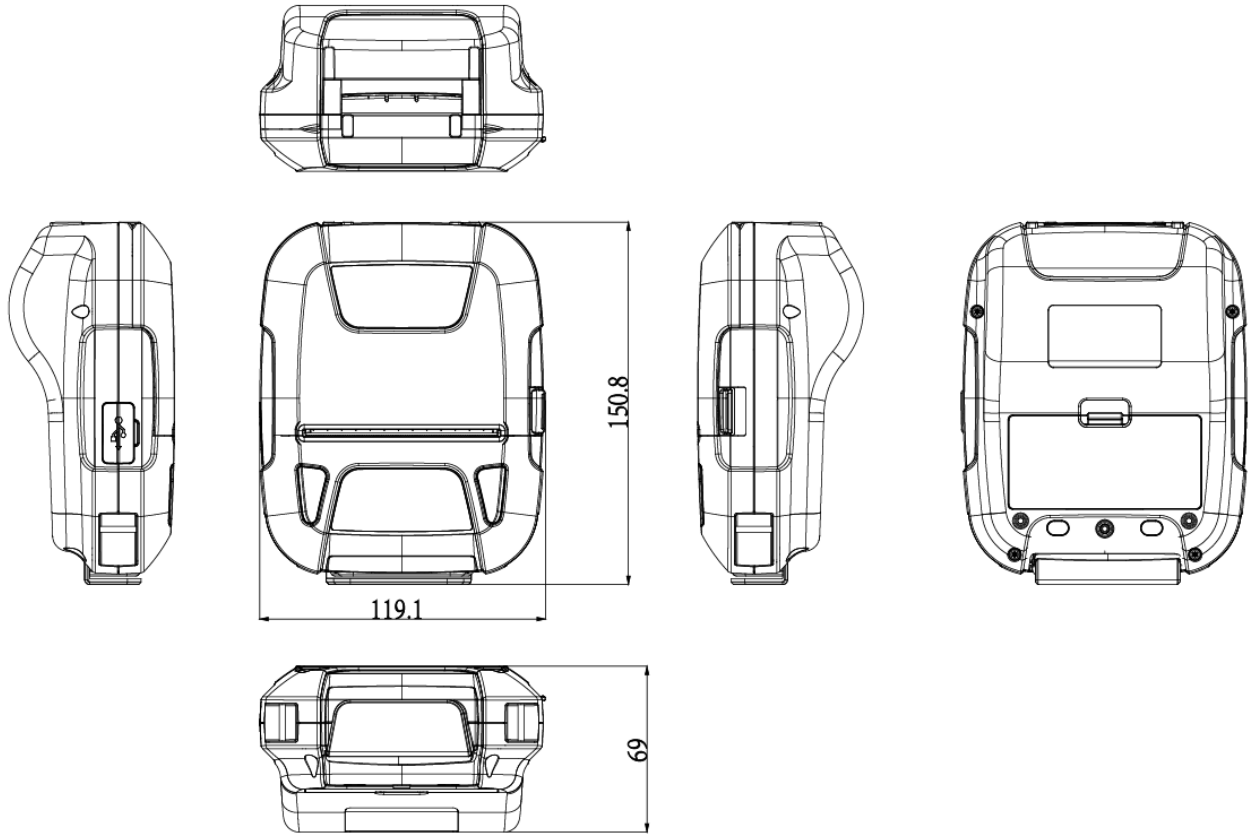


## ➢ SM-L304

・External Dimension: 119.1mm(W) x 150.8mm(H) x 69.0mm(D)

・Weight : 552g (including battery pack)

・Body Color : Gray and black



# 7. Release History

| Rev. No. | Date of Revision | Changes |
|---|---|---|
| Rev. 1.0 | May 2017 | First Edition |
| Rev. 1.1 | August 2019 | 1. Nominal change “LCD” to “OLED”<br>2. Addition of caution related battery pack<br>3. Declaration of Conformity<br>4. Page 86: Change Fitting regulation---Charging cradle<br>5. Correction of some errors |
| Rev.1.2 | April 2020 | 1. Add “Safety Instruction For Battery Pack” to “1.1 Printer &Accessories” (P2)<br>2. Move previous chapter 11.4 “Ferrite Core” to chapter 2.1.3. (P9) |
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*http://www.starmicronics.com/support/*

Rev. 1.2