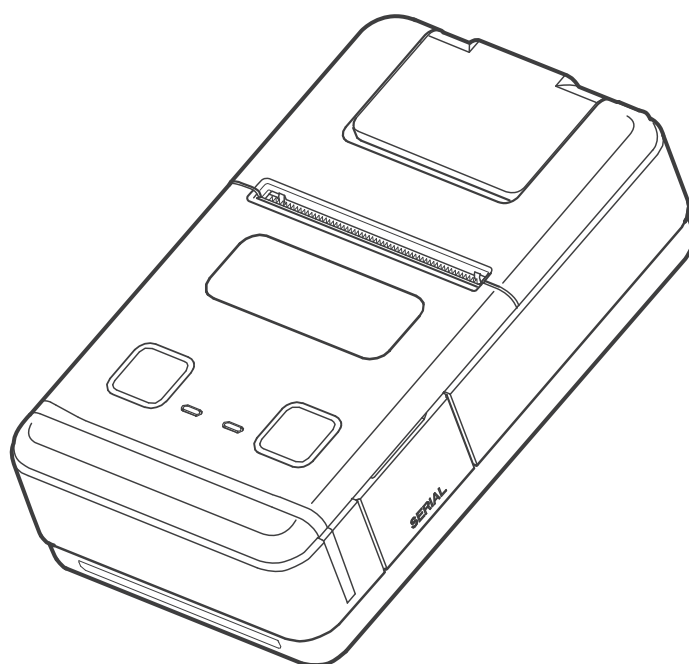


Mobile Printer

SM-S220 SERIES

Hardware Manual



CE2200

Made for

 iPod  iPhone  iPad

star 

<USA model>

Federal Communications Commission Radio Frequency Interference Statement

FCC ID : R49SM-S220

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.

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 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 off 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.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment has very low levels of RF energy that it is deemed to comply without testing of specific absorption ratio (SAR).

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 device, affix it to the interface cable.

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

<Europe model>

- English: Hereby, STAR MICRONICS CO.,LTD. declares that this Wireless Device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC
- Deutsch: Hiermit erklärt STAR MICRONICS CO.,LTD., dass sich das Gerät Wireless Device in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
[German]
- Svenska: Härmed intyggar STAR MICRONICS CO.,LTD. att denna Wireless Device står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
[Swedish]
- Español: Por medio de la presente STAR MICRONICS CO.,LTD. declara que el Wireless Device cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
[Spanish]
- Português: STAR MICRONICS CO.,LTD. declara que este Wireless Device está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
[Portuguese]
- Français: Par la présente STAR MICRONICS CO.,LTD. déclare que l'appareil Wireless Device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
[French]
- Suomi: STAR MICRONICS CO.,LTD. vakuuttaa täten että Wireless Device tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
[Finnish]
- Italiano: Con la presente STAR MICRONICS CO.,LTD. dichiara che questo Wireless Device è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
[Italian]
- Dansk: Undertegnede STAR MICRONICS CO.,LTD. erklærer herved, at følgende udstyr Wireless Device overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
[Danish]
- Nederlands: Hierbij verklaart STAR MICRONICS CO.,LTD. dat het toestel Wireless Device in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG
[Dutch]
- Eesti: Käesolevaga kinnitab STAR MICRONICS CO.,LTD. seadme Wireless Device vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
[Estonian]
- Ελληνική: ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ STAR MICRONICS CO.,LTD. ΔΗΛΩΝΕΙ ΟΤΙ Wireless Device ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
[Greek]
- Slovensky: STAR MICRONICS CO.,LTD. týmto vyhlasuje, že Wireless Device spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
[Slovak]
- Slovensko: STAR MICRONICS CO.,LTD. izjavlja, da je ta Wireless Device v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
[Slovenian]
- Česky: STAR MICRONICS CO.,LTD. tímto prohlašuje, že tento Wireless Device je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
[Czech]

Magyar: Alulírott, STAR MICRONICS CO.,LTD. nyilatkozom, hogy a Wireless Device megfelel a vonatkozó alapvető követelményeknek [Hungarian] és az 1999/5/EC irányelv egyéb előírásainak.

Български: това Безжично устройство е в съответствие със задължителните изисквания и другите приложими разпоредби на Директива [Bulgarian] 1999/5/EC.

PolSKI: Niniejszym STAR MICRONICS CO.,LTD. oświadcza, że Wireless Device jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC. [Polish]

Malti: Hawnhekk, STAR MICRONICS CO.,LTD., jiddikjara li dan Wireless Device jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC. [Maltese]

Latviski: Ar šo STAR MICRONICS CO.,LTD. deklarē, ka Wireless Device atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem. [Latvian]

Lietuvių: Šiuo STAR MICRONICS CO.,LTD. deklaruoja, kad šis Wireless Device atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas. [Lithuanian]

Norsk: STAR MICRONICS CO.,LTD. erklærer herved at utstyret Wireless Device er i samsvar med de grunnleggende krav og øvrige [Norwegian] relevante krav i direktiv 1999/5/EF.

Íslenska: Hér með lýsir STAR MICRONICS CO.,LTD. yfir því að Wireless Device er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í [Icelandic] tilskipun 1999/5/EC.

This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Notice: This device can be operated in all European countries.

France: Outdoor use limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz. (The wireless output power of this printer is less than 10mW e.i.r.p.)

Italy: For private use, a general authorisation is required if WAS/RLAN's are used outside own premises. For public use, a general authorisation is required.

Norway: This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund.



“Made for iPod”, “Made for iPhone”, “Made for iPad” mean that an electronic accessory has been designed to connect specifically to iPod, iPhone and iPad, respectively, and has been certified by the developer to meet Apple performance standards.

Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards.

iPod is a trademark of Apple Inc., registered in the U.S. and other countries.

iPod touch is a trademark of Apple Inc. iPhone touch is a trademark of Apple Inc. iPad touch is a trademark of Apple Inc.

Trademark acknowledgments

SM-S220: Star Micronics Co., Ltd.

Notice

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- 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.

Precautions for Using This Product

To use this product properly, 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 battery pack and battery charger. Then contact a Star Micronics dealer.
- ✓ The battery pack may be hot immediately after the product has been used.
- ✓ Do not attempt to repair the product.
Improper repairs are dangerous and could lead to injury. Contact the dealer that you bought the product for repairs.
- ✓ Do not disassemble or modify the product. Doing so could lead to injury, fire, or electric shock.

■ 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 communication cable while the printer is printing or during communication.
- ✓ Do not touch a communication 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 or when a PIN pad or other device that needs electricity is connected to the printer, the battery's performance will be diminished, and the amount of time that you can use the printer for may be reduced.

■ Thermal Paper Handling

- ✓ Only use thermal paper with the designated specifications.
- ✓ 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 of time.

■ 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: 30% RH to 80% RH (no condensation)
- ✓ Do not place the printer near a copying machine or other device that produces a strong electromagnetic 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.
- ✓ We recommend that you unplug the printer from the power outlet whenever you do not plan to use it 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.

■ 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.

Table of Contents

1. Product Overview	1
1.1 Printer & Accessories	2
1.2 External Appearance and Part Names.....	3
2. Setup	4
2.1 Buttery Pack	4
2.1.1 Inserting into the Printer	4
2.1.2 Charging the Battery	4
2.2 Bluetooth Settings	7
2.3 Memory Switch Settings	8
2.4 Loading Paper	11
2.5 Belt Clip	13
2.5.1 Attaching to the Printer	13
2.5.2 Using the Belt Clip.....	13
3. Printer Feathres	14
3.1 Control Panel.....	14
3.1.1 Buttons	14
3.1.2 Panel LEDs	14
3.1.3 LCD	14
3.2 Self Test.....	16
3.2.1 Self Test Procedure	16
3.2.2 Printing the Bluetooth Device Name and MAC Address.....	16
4. Paper	17
4.1 Paper Specifications.....	17
4.2 Recommended Paper (Common thermal roll paper)	17
4.3 Printing Range	17
5. General Specificatons	18

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:

- Pocket size (82×140×47 mm)
- Extremely light and mobile (289 g)
- Up to 8 hours of battery-powered operation (33% longer operation than previous 2inch printer)
- Quiet, direct thermal printing
- High-speed printing (up to 80 mm/s)
- Standard-equipped dual interface (RS-232C serial interface and Bluetooth Ver. 2.1 + EDR interface)
- Support for secure Bluetooth communications
Support for Bluetooth Security Mode 3 (PINs of up to 16 digits in length)
- LED backlit graphic LCD (128 × 32 dots)
- Remaining battery power, communication status, and error type indications on the LCD
- Support for the printing of text and graphics
- Support for the printing of a bit image (logo) stored on the printer (A special tool is required to register a logo on the printer.)
- Drop-in design that makes it easy to load paper
- Printer cover can be opened simply by pulling the lever
- [Apple Certified to print directly from iOS devices over Bluetooth](#)
- [Easy set-up to switch from printing directly from iOS to Android devices](#)

iPod, iPhone and iPad compatibility list

Made for

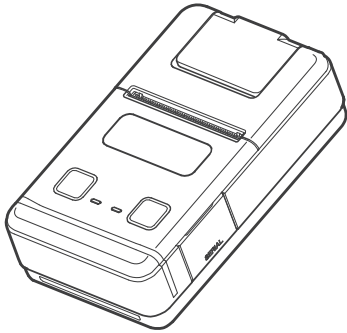
- iPod touch (4th generation)
- iPhone 4S
- iPhone 4
- iPad (3rd generation)
- iPad 2
- iPad

Note: as of July. 2012

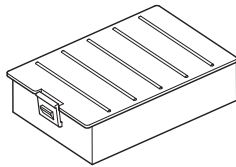
1.1 Printer & Accessories

The printer is packaged with the following accessories.

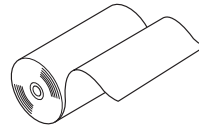
If any of these accessories is broken or missing, please contact the dealer that you bought the product.



Printer



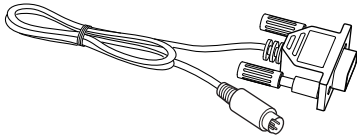
Battery Pack



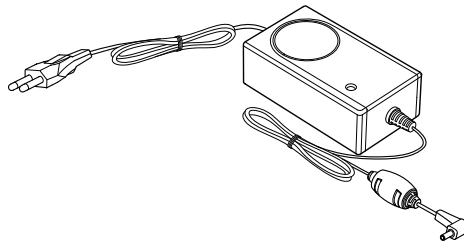
Printer paper sample



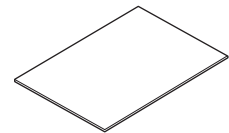
Belt Clip and Score



Serial Communication Cable

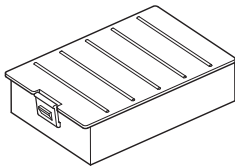


Battery Charger

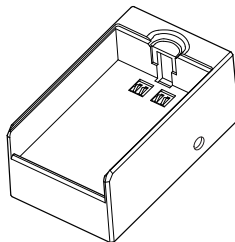


Safety Instruction Sheet

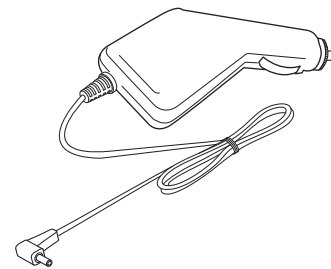
► The optional items for this printer are listed below.



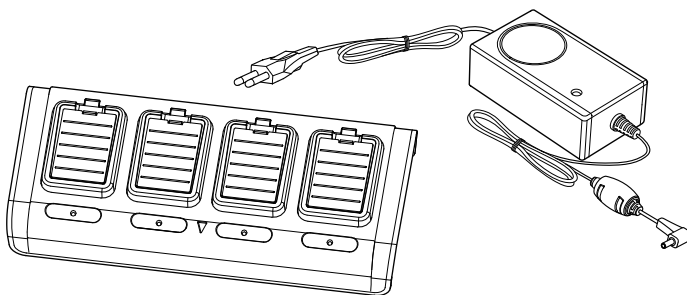
Extra Battery Pack



Battery Holder

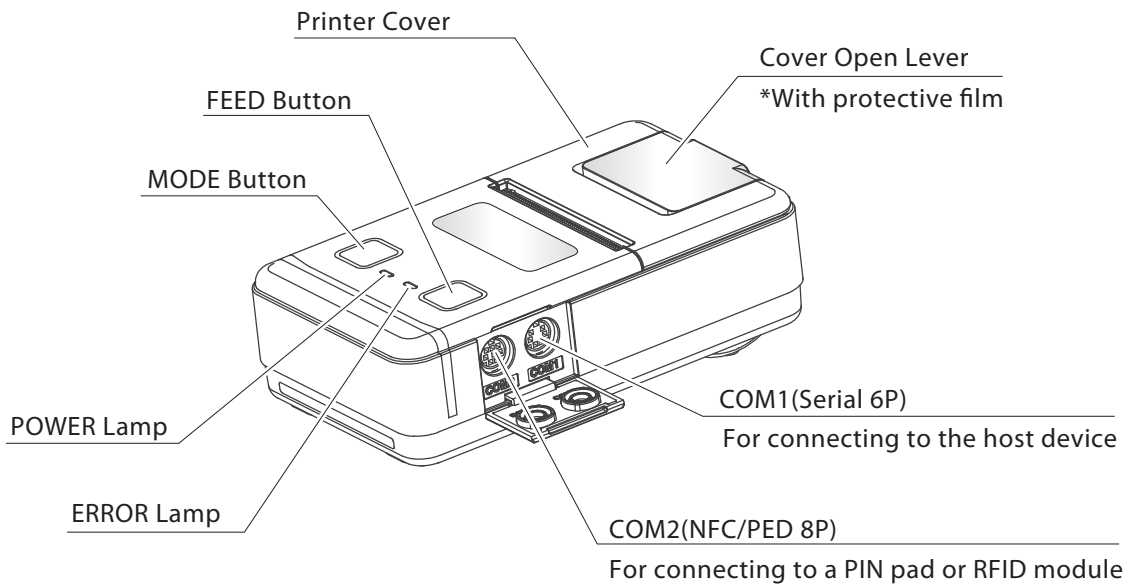


Car Charger

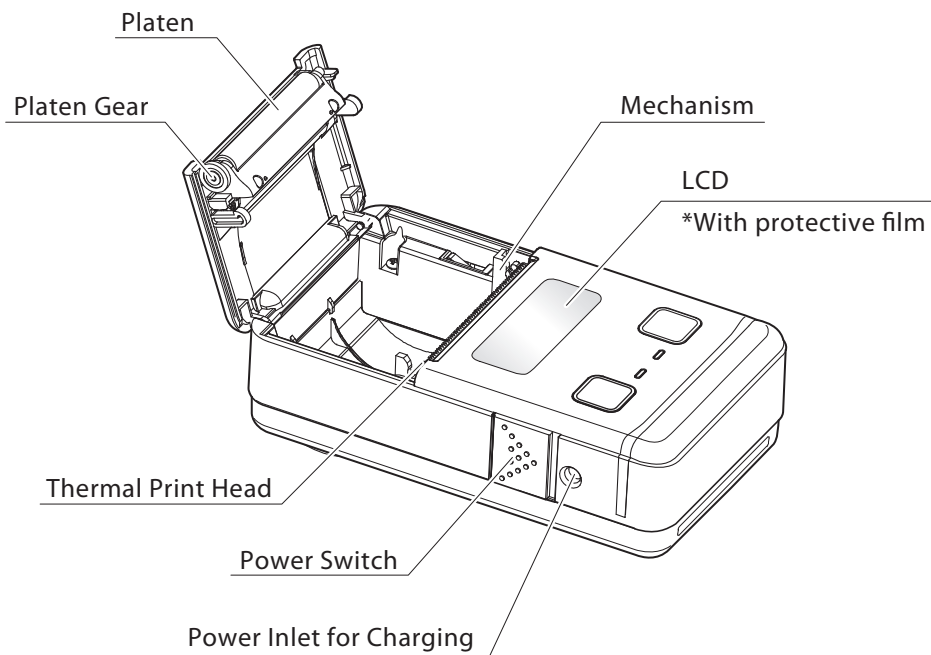


4 Unit Battery Charger (Special Battery Charger + 4 Unit Holder)

1.2 External Appearance and Part Names



* The LCD and Cover Open Lever are covered with a protective film. Remove the films if you do not need them.

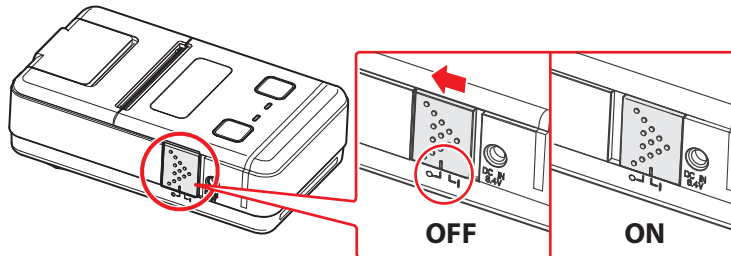


2. Setup

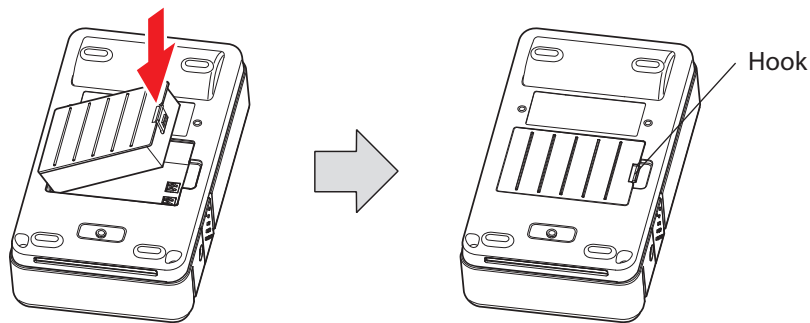
2.1 Battery Pack

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.

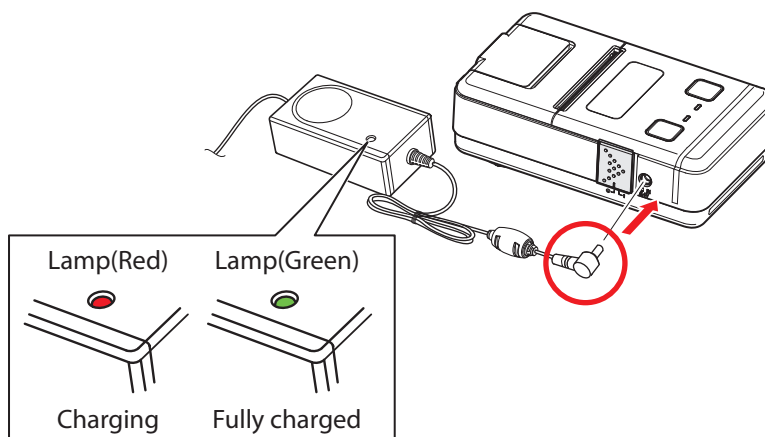


3. To remove the battery back, pull back the hook, and use the opposite procedure from the one you used to insert the battery pack.

2.1.2 Charging the Battery

Insert the battery pack into the printer to charge it.

Insert the battery charger cable into the printer's power inlet for charging.





Notes about the Battery Pack

► **General Battery Characteristics**

- The battery is a consumable and its performance over time will gradually decrease.
- While not in use, 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 and 40°C.
- The time required to charge the battery pack varies depending on the voltage and the ambient temperature.
Normally, it takes 4 to 5 hours to charge the battery pack.
- 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.
- There is no need to completely discharge or use up a rechargeable lithium ion battery before recharging 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 500 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.
- Only use the designated battery charging method.
You cannot use a battery charger other than the designated battery charger.
- Do not throw the battery into a fire, place it near a flame or heating device, or leave it in a hot environment (under direct sunlight, in a car, etc.).
- Do not use a battery pack that has been dropped or subjected to a shock in some other way.
- Do not disassemble or modify the battery pack.
- Do not short the terminals of the battery pack or get it wet.
Do not place the battery pack in a bag with a small metal object (such as a key).

► Notes about Storing the Battery Pack

- The characteristics of the battery pack may degrade if you store it in a charged state for a long period of time. If you do not intend to use the battery pack for a while, use up its power before storing it.
- If you do not intend to use the battery pack for a long time, be sure to remove it from the printer, and do not leave it connected to a battery pack holder for external charging.
- 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.

► Battery Disposal and Recycling

A lithium-ion battery 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.

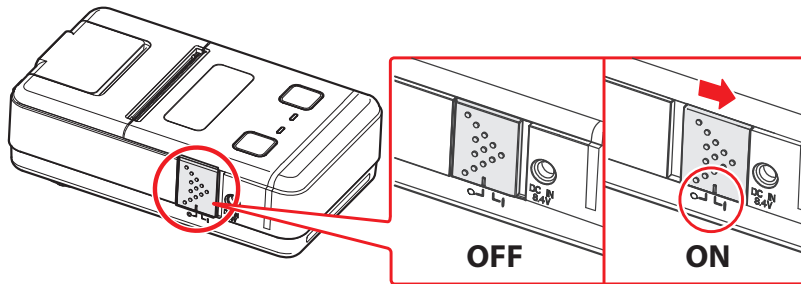
< For U.S.A. and Canada >



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.rbrclion.org/>

2.2 Bluetooth Settings

1. When you turn on the printer, it is ready to pair with another Bluetooth device.



2. If necessary, enter the following information into the terminal that you are using.

PIN: 1234 (default)

Device name: Star Micronics (default)

For security purposes, we recommend that you change the PIN.

For details about changing the PIN, please contact with our dealer.

⚠ CAUTION

During Bluetooth communication, if you transfer 1 MB or more of printing data, the buffer will overflow, and the data may not be printed properly.

2.3 Memory Switch Settings

Change the Memory switch by this operation. (Refer to “Memory Switch Setting Table”).

MODE button : Changing OPTION status.

FEED button : Changing PRINTER MODE status

* Example:

When you want to switch from the default settings to the following settings.

⇒ ①Bluetooth / ②9600 bps / ③Even Parity / ④2 Stop bit / ⑤Density High /
⑥High Speed / ⑦Use / ⑧Medium 2 / ⑨1 Minute Sleep

Follow the procedure below to change the settings.

1. Press and hold MODE for at least 5 seconds.

After the ERROR LED flashes five times, you can configure the settings.

The current communication mode will appear on the display.

- ① Press MODE once to change the communication mode to Bluetooth.

Bluetooth(iAP) → Bluetooth Mode

2. Press FEED once to switch the displayed setting from the communication mode to the baud rate.

The current baud rate will appear on the display.

- ② Press MODE once to switch the baud rate to 9600 bps.

115200 BPS → 9600 BPS

3. Press FEED once to switch the displayed setting from the baud rate to the parity bit type.

The current parity bit type will appear on the display.

- ③ Press MODE twice to set the parity bit type to even.

NO PARITY → ODD PARITY → EVEN PARITY

4. Press FEED once to switch the displayed setting from the parity bit type to the number of stop bits.

The current number of stop bits will appear on the display.

- ④ Press MODE once to switch the number of stop bits from one stop bit to two stop bits.

1 STOP BIT → 2 STOP BIT

5. Press FEED once to switch the displayed setting from the number of stop bits to the print density.

The current print density will appear on the display.

- ⑤ Press MODE once to set the print density to high density.

DENSITY MEDIUM → DENSITY HIGH

6. Press FEED once to switch the displayed setting from the print density to the print speed.

The current print speed will appear on the display.

- ⑥ Press MODE once to set the print speed to high speed.

LOW SPEED → HIGH SPEED

7. Press FEED once to switch the displayed setting from the print speed to the black mark sensor mode.

The current black mark sensor mode will appear on the display.

- ⑦ Press MODE once to switch the black mark sensor mode to the use.

MARK NO USE → MARK USE

8. Press FEED once to switch the displayed setting from the black mark sensor mode to the black mark sensor sensitivity.

The current black mark sensor sensitivity will appear on the display.

⑤ Press MODE twice to set the black mark sensor sensitivity to medium2.

SENSOR LOW → SENSOR MEDIUM1 → SENSOR MEDIUM2

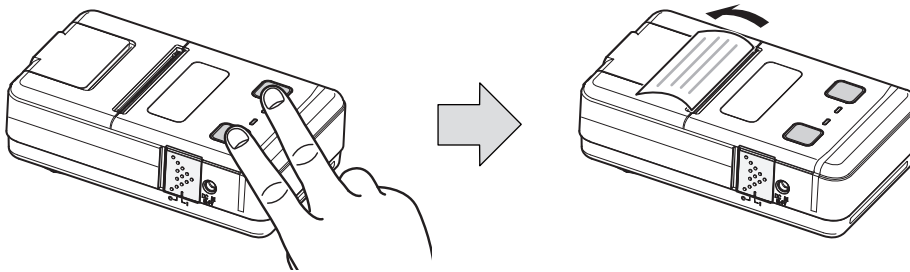
9. Press FEED once to switch the displayed setting from the black mark sensor sensitivity to the power down.

The current power down will appear on the display.

⑥ Press MODE once to set the power down to 1 minute sleep.

PWDN NO USE → PWDN 1 min.

After you have configured all of the settings, press and release FEED and MODE at the same time. The new settings will be printed.



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

Memory Switch Setting Table

	Printer Mode	Setting	Display
1	Communication Port *1)	Bluetooth(iOS) *	Bluetooth(iAP)
		Bluetooth	Bluetooth Mode
		RS-232C	UART Mode
2	Baud Rate	9600 bps	9600 BPS
		38400 bps	38400 BPS
		115200 bps *	115200 BPS
3	Parity Bit	No Parity *	NO PARITY
		Odd Parity	ODD PARITY
		Even Parity	EVEN PARITY
4	Stop Bit	1 Stop bit *	1 STOP BIT
		2 Stop bit	2 STOP BIT
5	Print Density	Density Low	DENSITY LOW
		Density Medium *	DENSITY MEDIUM
		Density High	DENSITY HIGH
6	Print Speed	Low (50mm/s) *	LOW SPEED
		High (80mm/s)	HIGH SPEED
7	Black Mark Sensor *2)	No use *	MARK NO USE
		Use	MARK USE
8	Black Mark Sensor Sensitivity	Low *	SENSOR LOW
		Medium 1	SENSOR MEDIUM1
		Medium 2	SENSOR MEDIUM2
		High	SENSOR HIGH
9	Power Down	No use *	PWDN NO USE
		1 Minute Sleep	PWDN 1 min.
		2 Minute Sleep	PWDN 2 min.
		3 Minute Sleep	PWDN 3 min.
		4 Minute Sleep	PWDN 4 min.
		5 Minute Sleep	PWDN 5 min.

*1) Communication mode

It is possible to change the communication mode setting between Bluetooth and serial. Please see below for details to select the proper communication mode for your application.

Bluetooth (iOS):

The display shows [Bluetooth(iAP)]. At the Bluetooth (iOS) mode, the printer can communicate with an iOS device over Bluetooth.

Bluetooth:

The display shows [Bluetooth Mode]. At the Bluetooth mode, the printer can communicate with an Android device or a device other than iOS devices over Bluetooth.

RS-232C:

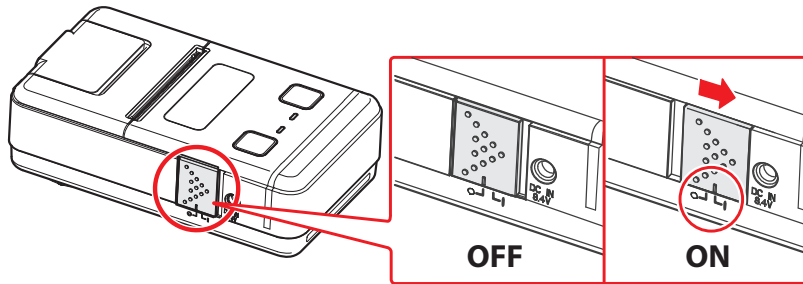
The display shows [UART Mode]. At the RS-232C mode, the printer can communicate with a device using the serial communication cable supplied with the printer. When you connect the serial cable, the printer is automatically switched to serial communication from Bluetooth communication.

*2) When the black mark sensor is set to Use, the printer cannot detect the paper-end status.

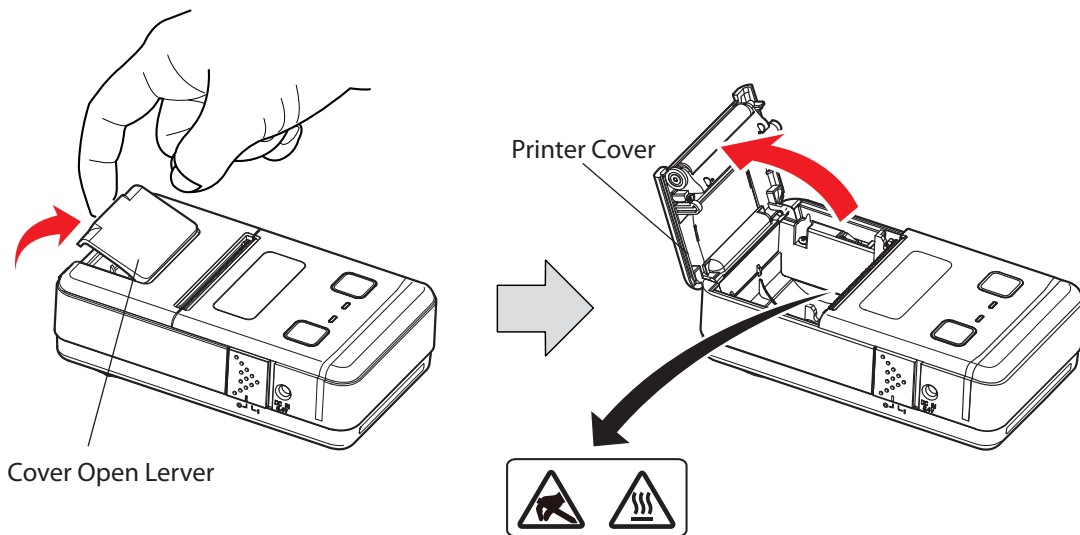
2.4 Loading Paper

Refer to chapter 4, "Paper" (p. 17), to select roll paper that conforms to the specifications.

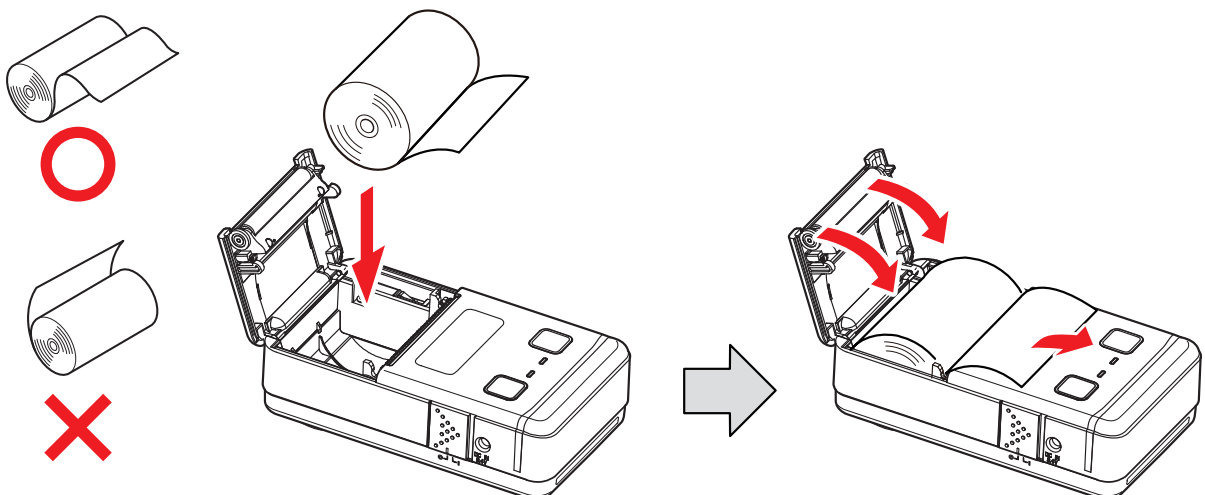
1. Turn on the printer.



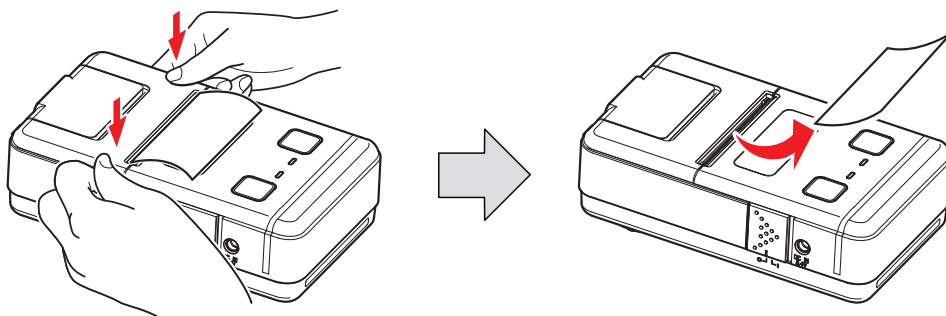
2. Put your finger on the lever for opening the cover, and then open and raise the printer cover.



3. Load the roll paper in the orientation shown in the figure below, and then pull the end of the roll straight toward you.



4. Press down on both sides of the printer cover to close it firmly.
When you close the printer cover, make sure that it is closed on both sides.
5. Use the tear bar to cut the extra paper.



⚠ CAUTION

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. Not only should you not put your hand in the paper outlet slot while printing is in progress, never 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.*

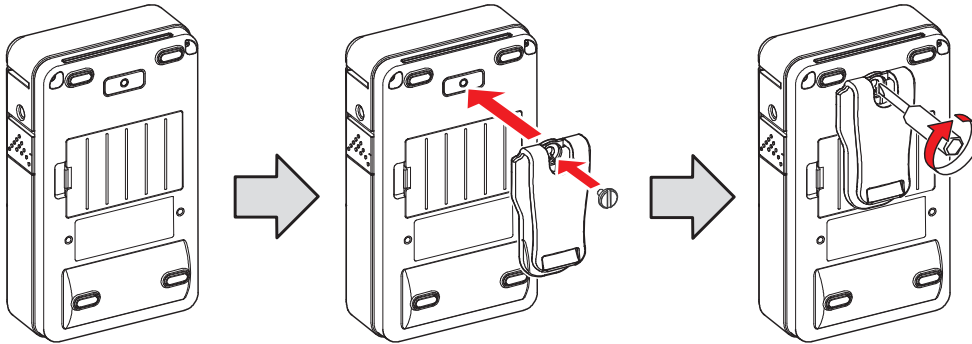
2) *During and immediately after printing, the area around the thermal head is very hot. Do not touch it, as you could be burned.*

2.5 Belt Clip

2.5.1 Attaching to the Printer

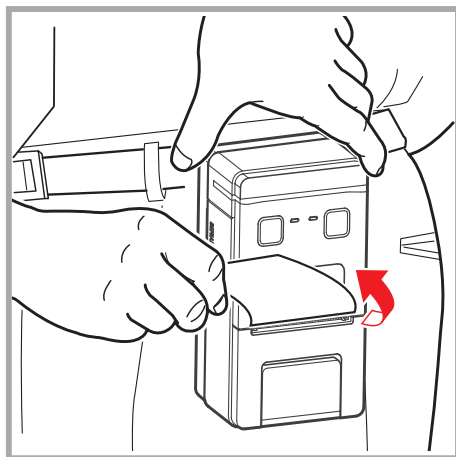
Follow the procedure below to attach the belt clip to the printer.

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



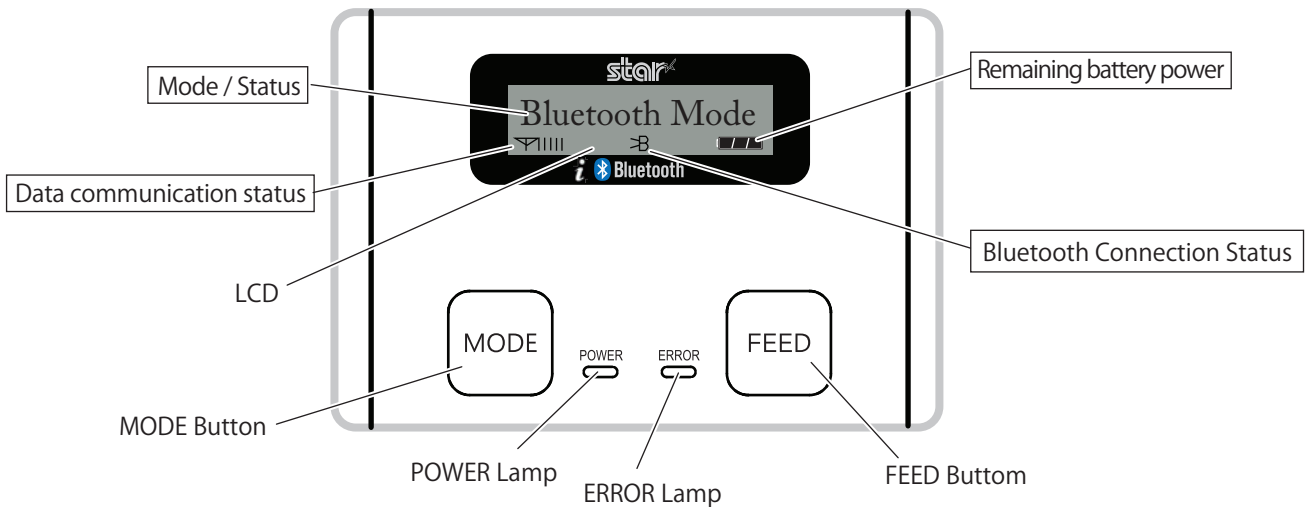
2.5.2 Using the Belt Clip

When the printer is attached to your belt, hold the printer steady with your hand when you use it.



3. Printer Features

3.1 Control Panel



3.1.1 Buttons

- 1) FEED button: When the printer is on, you can press FEED to feed the paper.
- 2) MODE button:

You can change the communication mode and print settings by configuring the printer's mode settings. You can configure the mode settings after you press and hold MODE for 5 seconds or more and the ERROR LED flashes five times.
(For more information about mode settings, see section 2.3, "Memory Switch Settings.")

3.1.2 Panel LEDs

- 1) POWER LED (green): Lights when the printer is on. The printer can receive data when the POWER LED is on.
- 2) ERROR LED (red): Lights when there is a printer error and when the printer is receiving data.


3.1.3 LCD

- 1) The 128 × 32 dot (16 × 2 line) display shows alphanumeric characters.
- 2) Content

Mode/Status : Indicates the currently specified printer mode or error status.


Data communication status :  ... The image shown on the left indicates that the data communication status is good.

Remaining battery power :  ... There is sufficient remaining battery power.

 ... The remaining battery power is low. Please charge the battery pack.

Flashing ... The remaining battery power is extremely low.

Stop using the printer immediately, and charge the battery pack.

Bluetooth connection status :  ... The mark on the left indicates that there is a Bluetooth connection.

When there is no Bluetooth connection, the mark is not displayed.

■ LED & LCD Display / Error

Printer Status		Action	LED		LCD	Buzzer		
			POWER (Green)	ERROR (Red)				
Printer Initialization(Power On)			Flickering	Flickering	Display : [Bluetooth Mode] Back Light : Flickering during initialization	Beep 3		
On-Line	COM1 Cable not	Stand-by	ON	OFF	Display : [Bluetooth Mode] Bluetooth connected / disconnected Back Light : 1 sec flickering and OFF	Nothing		
		Cable Connected			Display : [Cable Detect] →[UART Mode] Back Light : 1 sec flickering and OFF	Beep 2		
	COM1 Cable Connected	Stand-by			Display : [UART Mode] Back Light : 1 sec flickering and OFF	Nothing		
		Taking Off Cable			Display : [Cable Out] →[Bluetooth Mode] Back Light : 1 sec flickering and OFF	Beep 2		
	Operation Mode	PIN PAD			ON	OFF	Display : [PIN Mode] Back Light : 1 sec flickering and OFF	Nothing
	Receiving Data					ON	ON	Status of Antenna Icon is changed No displayed Back Light : OFF
On-Line (Busy)	Printing Data		ON	OFF	Display : [Working...] Back Light : ON	Nothing		
Stored Terminal Setting			Flickering	Flickering	No displayed	Nothing		
Setup Mode			ON	OFF	[Setup Mode]→[Print Status] <Get out Setup Mode> Display : [Setup Mode] Back Light : ON	Nothing		
Test Printing			ON	OFF	Display : [Print Test] →[Working...] Back Light : ON	Nothing		
Writing Firmware			ON	OFF	Display : [Downloading...] Back Light : ON	Nothing		
Error	Recoverable Error	No Paper Error	ON	Flickering	Display : [Paper Empty] Back Light : ON	① Happened →Beep 3 ② Recovered →Beep 1		
		Cover Open Error	ON	Flickering	Display : [Cover Open] Back Light : ON	① Happened →Beep 3 ② Recovered →Beep 1		
	Auto Recoverable Error	Heat Protection of Thermal Head	ON	Flickering	Display : [Head Hot] Back Light : ON	① Happened →Beep 3 ② Recovered →Beep 1		

3.2 Self Test

You can use a 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.

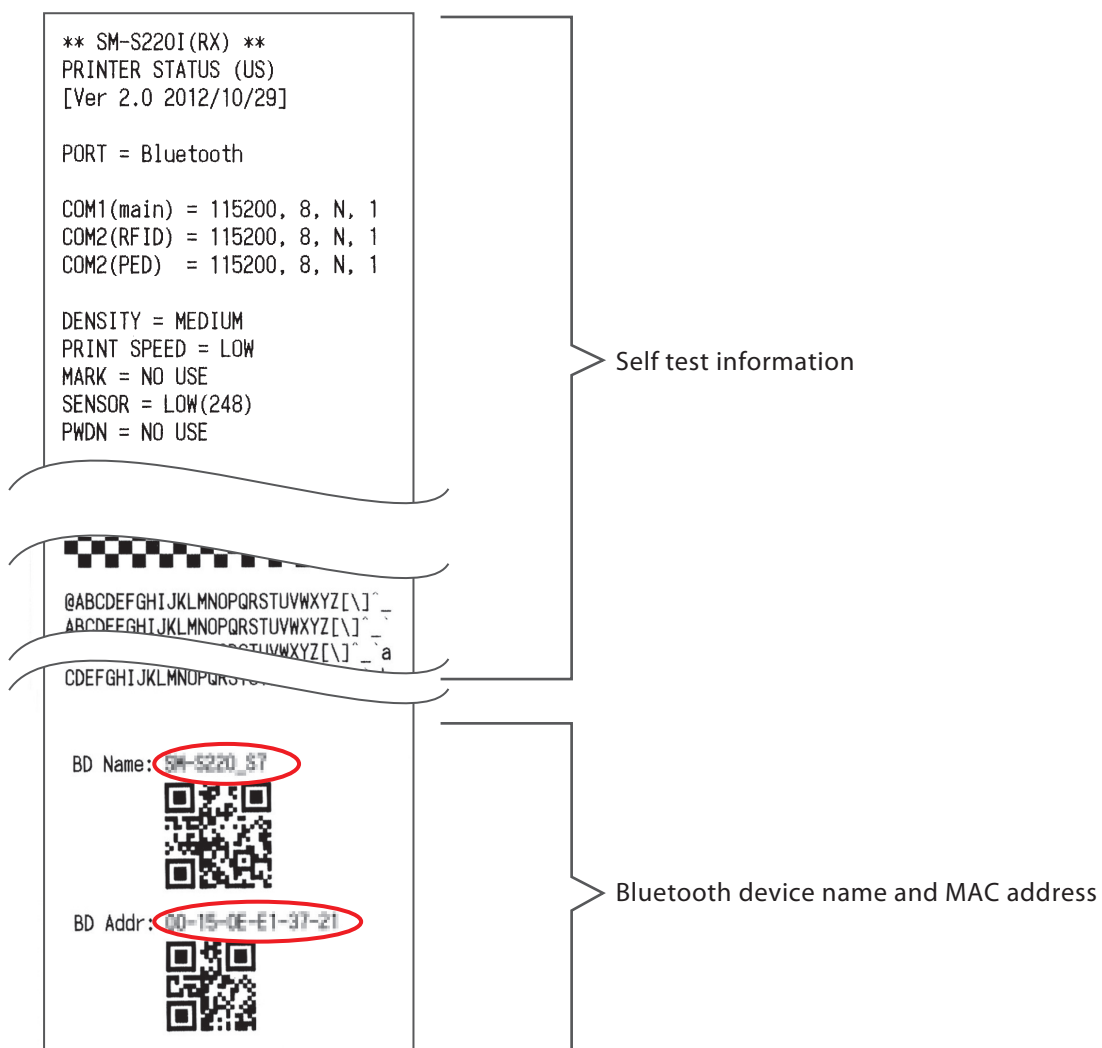
3.2.1 Self Test Procedure

- 1) Turn on the power while holding down FEED.
- 2) The printer will print the current printer status, including the firmware version, communication mode, and print settings.
- 3) The self test will finish automatically. The printer will be ready to receive data after the self test finishes.

3.2.2 Printing the Bluetooth Device Name and MAC Address

- 1) Follow the procedure in section 3.2.1 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, and the self test will finish automatically.

The printer will be ready to receive data after the self test finishes.



4. Paper

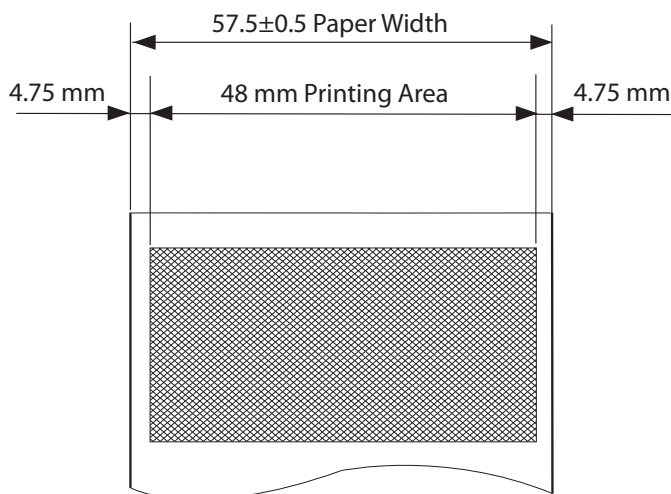
4.1 Paper Specifications

Type : Thermal Paper
Paper width : 57.5 ± 0.5 mm
Paper thickness : 65 ± 5 μ m
External diameter : $\varnothing 40$ mm or less
Inner diameter : $\varnothing 12 \text{mm} \pm 1$ or more
Printed surface : Outer edge of roll

4.2 Recommended Paper (Common thermal roll paper)

Manufacturer	Product Name
Mitsubishi Paper Mills Limited	P220AG
Oji Paper Co., Ltd.	PD450
APPLETON	Alpha 800-2.4
KANZAKI (Oji Paper USA)	P-350

4.3 Printing Range



⚠ 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) The roll paper starts changing color at approximately 70°C.
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. General Specifications

Item	Specifications		
Printing method	Direct line thermal printing		
Characters per line	Maximum 42 cpl		
Character size	Alphanumeric characters: 12 X 24 dots, 9 X 24 dots, and 7 X 17 dots Japanese characters: 24 X 24 dots		
Character types	Alphanumeric characters, expanded graphic characters, JIS Level-1 Kanji Set, JIS Level-2 Kanji Set, and special characters		
Dot density	203 dpi (8 dots/mm)		
Printing width	48 mm (384 dots)		
Print speed	80 mm/s (max) or 50 mm/s (default)		
Interface	Bluetooth	Bluetooth Spec.	Bluetooth Ver 2.1+EDR / Class2 (10m)
		Frequency Range	2.4GHz ISM BAND (2402~2480 MHz)
		RF Power	Below 10 dBm
		Modulation method	GFSK, 8DPSK
		Oscillation method	PLL
	RS-232C × 2		
Roll paper	Thermal roll paper (57.5 ± 0.5 mm wide with a diameter of Φ40 mm)		
Barcode	1D: JAN, EAN, UPC, ITF, Code39, Code93, Code128, CODABAR(NW-7) 2D: PDF417, QR Code, DATA Matrix		
Communication packet size	Maximum 8K byte		
Emulation	ESC/POS		
LCD	128 × 32 dots (LED backlight)		
Battery pack	Lithium ion 7.4 V DC (rechargeable), 1130 mAh		
Battery operating time	Approximately 8 hours (normal mode) Approximately 45 minutes (continuous printing)		
Battery charger	Input: 100 to 250 V AC, 50 to 60 Hz Output: 8.4 VDC/0.8 A, Time required for full charge: 4 h		
Environmental Requirements	Temperature *1)	0 °C to 50 °C (for operation) -20 °C to 60 °C (for storage)	
	Humidity	30% to 80% (for operation) 10% to 90% (for storage)	
Print head life	Approximately 50 km		
Drop resistance	1.2 m. Please note that this value was obtained under testing conditions stipulated		

*1) When the temperature of the operating environment is 10°C or less, in the memory switch settings, set the print density to high.

■ External Specifications

External dimensions: Approximately 82 mm (W) × 140 mm (D) × 47 mm (H)

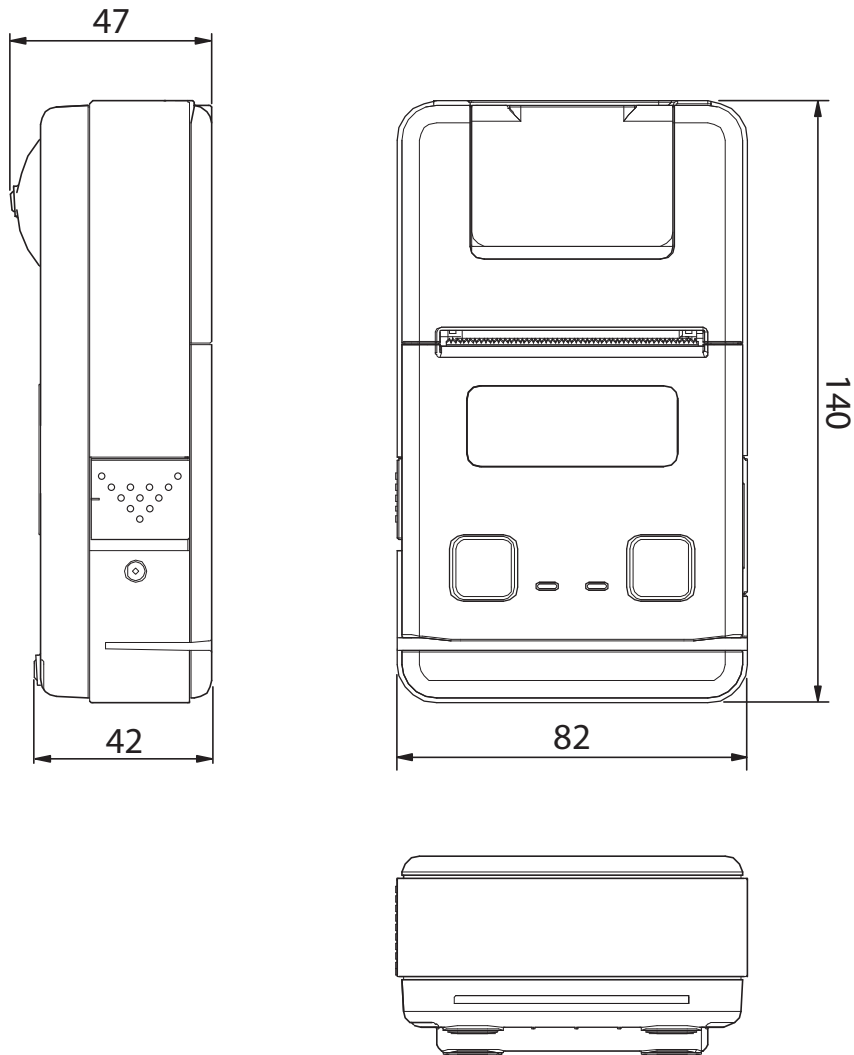
Weight: 289 g (printer + battery pack).

* The weight of the roll paper is not included.

Body color: Front → Shiny black

Back → Black

Side → Blue silver





URL: <http://www.starmicronics.com/support/>

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