



GENERAL SPECIFICATION

mC-Label2

REV. NO. 1.00

- ◆ Refer to the online manual for detail the product setup or uses.



mC-Label2 Online Manual

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- The contents of this specification may change without notice.
- Every effort has been made to ensure the accuracy of the contents of this specification, but if you have any questions or find errors or omissions, please contact us.
- The precautions described in this specification do not cover all possible events.
We will not be held responsible for any damages incurred in regarding to effects or faults when using this product.

Safety Precautions

- This section contains safety information for preventing harm to users of this product, to third persons, and damage to property.
Carefully read before using this product and use the product properly.
- Star Micronics shall not be liable for any damage that occurs as a result of incorrect use that is inconsistent with the safety information or the product manual, or for any damage that occurs due to repairs/changes made by a third party who is not part of our company or specified by our company.

Warning

Warning

- Immediately turn the power off and pull the power plug out of the electrical outlet if it emits heat, smoke, abnormal smells or abnormal sounds.
Then contact the seller.
If the use of the product is continued, fire or electric shock may occur.
- Do not disassemble, repair or modify.
Doing so may cause fire, electric shock or injury.
- When pulling out the power plug, always pull the plug and not the cable.
Otherwise, the power cable may be damaged, and a short circuit, fire or electric shock may occur.
- Do not damage, modify, forcefully bend, pull, twist, put a heavy object on, or squeeze the power cable.
Otherwise, the power cable may be damaged, and a short circuit, fire or electric shock may occur.
- Do not use a damaged power cable or power plug, or loose electrical outlet.
Otherwise, it may cause a short circuit, fire or electric shock.
- Do not touch the power plug with wet hands.
Doing so may cause electric shock.
- The cutter is inside the paper exit. Be careful when touching the cutter for maintenance and parts replacement, as mishandling may lead to injury.
- There is tear bar in the paper exit. Do not touch the tear bar as it can cause injury.
- If foreign matter such as liquid or metal fragments get inside this product, immediately cut off the power and pull the power plug out of the electrical outlet. Then contact the seller.
If use of the product is continued, fire or electric shock may occur.

Installation Notes

Warning

Do not install in the following locations.

Doing so may cause electric shock or fire.

- Locations where there is a danger of electricity or water leakages.
- Locations that are in the vicinity of fire, that are subject to direct sunlight, or where heat may be trapped.

Caution

Do not install in the following locations.

Installation in the following locations may cause malfunction.

- Locations where there is static electricity or where a strong magnetic field is generated.
- Locations where ventilation is poor or there is much dust.
- This product uses DC motors and switches which require contact with electricity; therefore avoid using in locations where silicone gas or flammable gas is volatilized.
- Locations where temperature and humidity exceed the usage environment conditions, or where condensation occurs.
- Locations where the floor is not flat, or where vibrations occur.
Problems such as paper feeding error may occur.
- Do not use the same electrical outlet as the one where equipment that generates noise such as copiers and refrigerators are connected to.
- Location at a distance from an electrical outlet.
Install in a location that is near the electrical outlet so that the power plug can be immediately pulled out if improper operation occurs.

Installation of accessories and optional products

When installing accessories and optional products, turn the power of this product off, and pull the power plug out of the electrical outlet.

Carefully read the installation steps in the manual and install correctly.

Handling Precautions

Caution

- If the product will not be used for a long time, pull the power plug out of the electrical outlet to ensure safety.
- When connecting or removing a cable, unplug the power cable for both this product and the computer from the electrical outlet to ensure safety.
- Be careful not to forcibly pull the connected USB cable, LAN cable, or power cable.
- When disconnecting a cable, always grasp the plug part, and make sure that no excessive force is applied to the connector on the printer side.
- It is recommended to replace the platen roller once every one to two years because its performance degrades over time. <Standard Model>
- It is recommended to promptly remove any glue accumulating on the blade of the cutter unit, as it can cause malfunction. <Standard Model>
- Use the product with the printer cover and the rear cover on the back installed.
- Do not open the printer cover while the printer is printing or cutting.
- Do not pull out the paper while the printer cover is closed.
- Be careful not to get your hands trapped when opening or closing the printer cover. There is the risk of injury.
- As the heating element in the thermal printer head and the driver IC part can be easily damaged, do not allow direct contact with metals, sand paper and such.
- Remove the cut paper from the printer promptly.
- Do not operate the printer if there is moisture (which has been caused by condensation or another factor) on the front surface of the print head.
- If the thermal sheet has a large amount of [Na+, K+, or Cl-] then the life of the thermal printer head may be drastically shortened. We recommend using products with ion concentration of Na+ 500 ppm, K+ 150 ppm, and Cl- 300ppm or less.
- Use in accordance with indicated environmental specifications. Even if the environmental temperature/humidity is within specifications, avoid drastic environmental condition changes. Refer to "2.3. Environmental specifications" for the environment suitable for using this product.
However, when you want to charge your smartphone or tablet from the printer, use both the printer and device within the temperature range that satisfies the environmental specifications of the respective products.
When using label paper, make sure that the environmental specifications set for both the printer and the label paper are met.
- If you are using drivers provided by Star Micronics, limit the maximum number of devices connected to a single host device and LAN interfaces to 10.
- When disposing of this product, be sure to follow local ordinances and regulations.
- When replacing paper, remove the paper core remaining in the paper roll holder.

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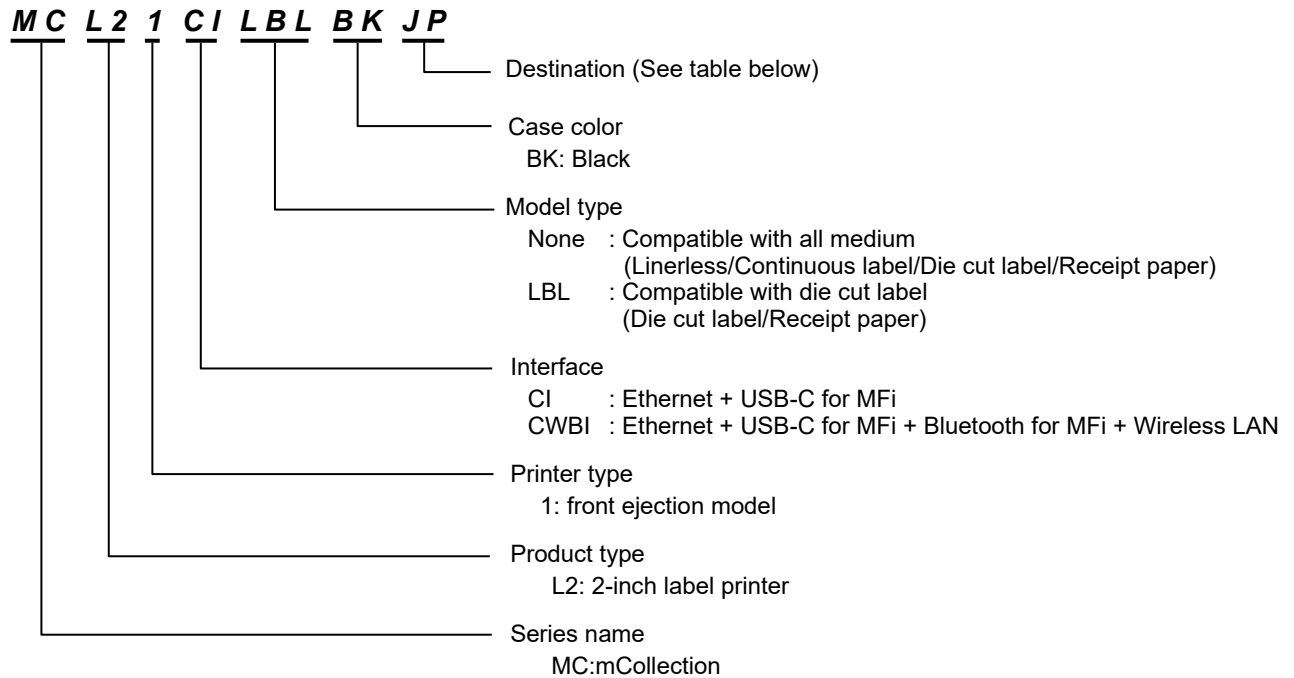
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1. Product Overview

mC-Label2 is a direct line thermal printer in mCollection series.

1.1. Model name



<MCL21CI / MCL21CI LBL>

Destination	Provided power cable
US	US cable
E+U	EU cable + UK cable
JP	JP cable
AS	AS cable
EU	EU cable
UK	UK cable

<MCL21CWBI / MCL21CWBI LBL>

Destination	Provided power cable	Wireless LAN channel setting
US	US cable	C01
E+U	EU cable + UK cable	C02
JP	JP cable	C03
AS	AS cable	C04
SAUS	US cable	C04
SAEU	EU cable	C04
SAUK	UK cable	C04

Note) In this document, the model names are abbreviated as follows:

<Models by supported paper types>

MCL21CI / MCL21CWBI (models supporting all medium) : Standard model

MCL21CI LBL / MCL21CWBI LBL (models supporting die cut label) : LBL model

<Models by communication types>

MCL21CI / MCL21CI LBL : Wired model

MCL21CWBI / MCL21CWBI LBL : Wireless model

1.2. Product contents (accessories, options)

[Accessories]

- AC adapter
- Power cable 1.8 m
- USB cable (A-C) 1.8 m
- Flyer
- Safety guide
- Setup guide

<Notes>

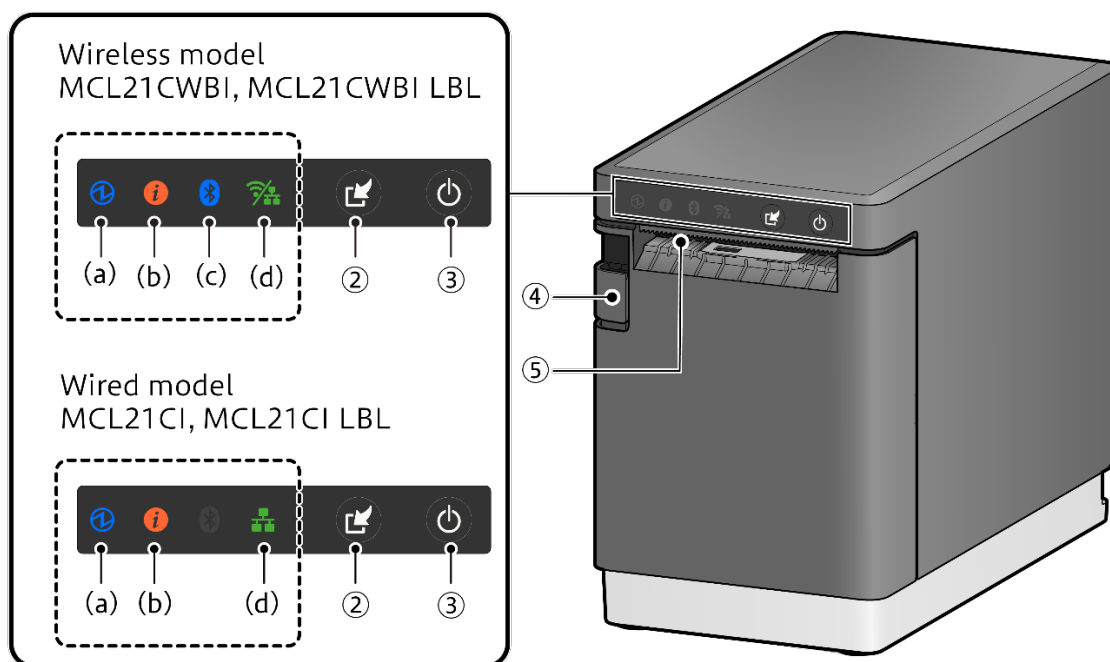
Accessories vary depending on the region where the printer was purchased.

[Options]

- | | | |
|---------------------------------|-------------------|---|
| ● Barcode scanner | Model | : BCR-POP1 |
| | Connection | : USB-A port |
| | Supported barcode | : 1D |
| ● Customer display | Model | : SCD222U |
| | Connection | : USB-A port |
| ● AC adapter | | |
| ● USB cable (A-C) 1.8 m | | |
| ● Cutter unit | | : Replacement parts [standard model only] |
| ● Platen unit | | : Replacement parts [standard model only] |
| ● Cutter unit + Platen unit set | | : Replacement parts [standard model only] |

1.3. Part names and functions

[Front/side of the printer]



① LED lamp

Indicates the printer status.

- (a) Power LED : Lights up and flashes according to the printer status when the power is turned on.
- (b) Information LED : Lights up and flashes while cleaning, replacing parts, or print job is stuck.
- (c) Bluetooth LED : Lights up blue according to the Bluetooth connection status. (Wireless model only)
- (d) Network LED : Lights up green according to the network connection status.

The symbol differs depending on wired and wireless models.

For details, see "4 Operating Portion and Function".

② Multi-function button

Press this button to feed paper. Also, use this button for One Touch Label and self-printing.

For details, see "4 Operating Portion and Function".

③ Power button

Use this button to turn the power ON or OFF, or to restart the printer.

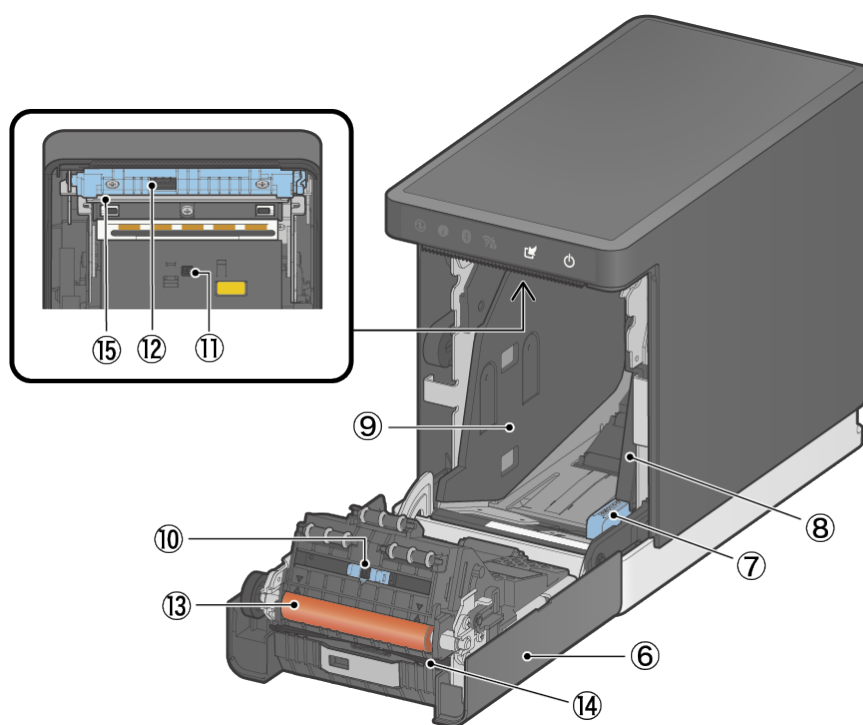
④ Cover opening lever

Pull this lever to open the printer cover when setting the paper roll.

⑤ Paper exit/Tear bar

The printed paper is ejected from here. Paper can be cut manually using the tear bar.

[Inside of the printer]



⑥ Printer cover

Opens/Closes when setting the paper roll. Also, remove the resin cover when cleaning the auto cutter.

⑦ Paper guiding lever

When adjusting the width of the paper guide, push the lever down and move the paper guide left and right.

⑧ Paper guide (R)

⑨ Paper guide (L)

⑩ PE/BM sensor

This sensor detects the trailing edge of the paper or BM on the back of the paper.

⑪ GAP sensor

This sensor detects the boundaries of die cut label paper.

⑫ Hold print sensor

[Standard model only] This sensor detects when the paper has been removed from the printer.

⑬ Platen roller unit

[Standard model] Non-adhesive roller (orange) : Compatible with all paper types including linerless label paper.

[LBL model] General rubber roller (black) : Compatible with die cut label and receipt paper.

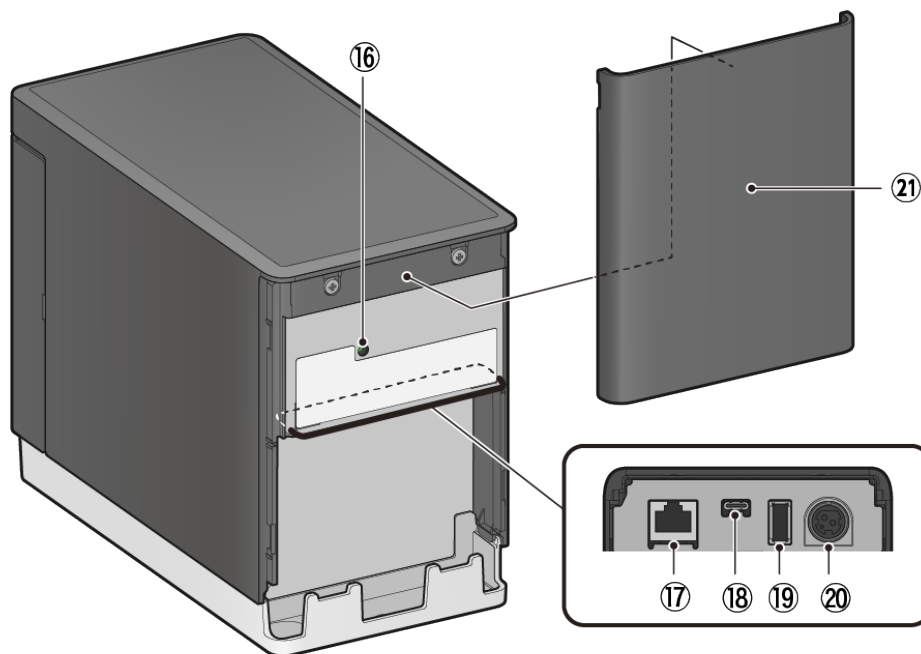
⑭ Auto cutter unit

[Standard model only] The auto cutter automatically cuts the paper. *Not installed on LBL models.

⑮ Fixed blade unit

[Standard model only] Blade is installed for cutting the paper. *Blade is not installed on LBL models.

[Back of the printer]



⑩ RESET switch

Initializes the communication settings of mC-Label2.

⑪ LAN port

Connects the printer to the network by using the LAN cable.

⑫ USB-C port

Connects your iOS, Android, or Windows device by using the USB cable.

⑬ USB-A port

Connects and communicates with a USB-compatible product (customer display barcode scanner) specified by our company.

⑭ Power connector

Connects the cable of power adapter that comes with the printer.

⑮ Rear cover

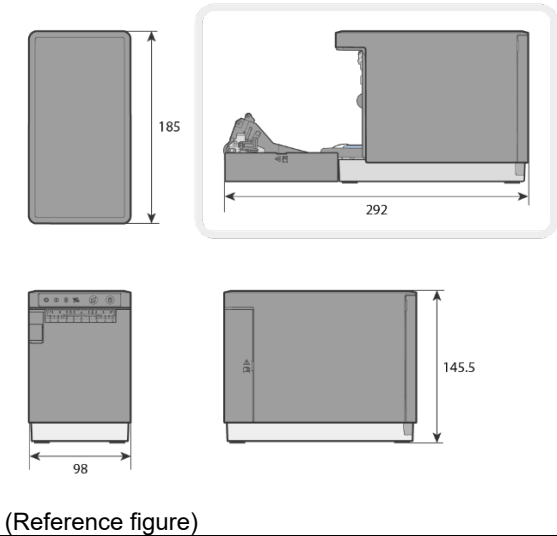
Protects terminals and cables. Use the product with the rear cover installed.

2. Product Specifications

2.1. General specifications

Item		Specifications	
Printing specifications *1	Print method	Direct thermal (Thermosensitive type)	
	Print speed	Maximum 180 mm/sec (default)	
	Print width	15.0 to 56.9 mm (default: 48.7 mm) (configurable in 1.0 mm unit)	
	Paper width	24.5 to 59.5 ±0.5 mm	
	Roll diameter	Maximum 102 mm	
	Top margin	3 mm (default), 10 mm	
	Paper feeding	Friction feeding method	
Head specifications	Resolution	300dpi	
	Dot configuration	672 dots/line	
Barcode*2	1D	UPC-A, UPC-E, JAN/EAN8, JAN/EAN13, ITF, CODE39, CODE93, CODE128, CODABAR(NW-7) GS1-128, GS1 Omnidirectional, GS1 Truncated, GS1 Limited, GS1 Expanded	
	2D	PDF417, GS1 Stacked, GS1 Stacked Omnidirectional, GS1 Expanded Stacked, QR Code	
	Composite	GS1 Composite Symbols	
Font*3	Specifications	European and US letter code	Code Page: Supported
		Chinese character code	Japanese: Supported, Traditional Chinese (Big5): Supported, Simplified Chinese (GB18030): Supported
		Unicode	UTF-8: Supported (specific font only)
	Type	ANK:Font-A	12 x 24 dots/1.02 mm x 2.03 mm (When enlarging basic print size: 18 x 36 dots/1.52 mm x 3.05 mm) IBM Block: 12 x 32 dots/1.02 mm x 2.71 mm (When enlarging basic print size: 18 x 48 dots/1.02 mm x 4.06 mm)
		ANK:Font-B	9 x 24 dots/0.76 mm x 2.03 mm (When enlarging basic print size: 14 x 36 dots/1.19 mm x 3.05 mm) IBM Block: 9 x 32 dots/0.76 mm x 2.71 mm (When enlarging basic print size: 14 x 48 dots/1.19 mm x 4.06 mm)
		Japanese kanji characters: 96 alphanumeric characters	24 x 24 dots/2.03 mm x 2.03 mm (When enlarging basic print size: 36 x 36 dots/3.05 mm x 3.05 mm)
		Japanese kanji characters: Extended graphics 128 characters	
		Japanese kanji characters: 3489 characters for JIS Level 1	
		Japanese kanji characters: 3390 characters for JIS Level 2	

Item		Specifications	
		Japanese kanji characters: 83 special characters	
		Japanese kanji characters: 374 characters for NEC selected IBM extended characters	
		Japanese kanji characters: 388 characters for IBM extended characters	
		Japanese kanji characters: 282 characters for single-byte kanji	12 x 24 dots/1.02 mm x 2.03 mm (When enlarging basic print size: 18 x 36 dots/1.52 mm x 3.05 mm)
		Chinese characters (compliant with GB18030): 96 alphanumeric characters	24 x 24 dots/2.03 mm x 2.03 mm (When enlarging basic print size: 36 x 36 dots/3.05 mm x 3.05 mm)
		Chinese characters (compliant with GB18030): 28574 Chinese characters	
		Traditional Chinese BIG5(F): Alphanumeric characters 96 characters	24 x 24 dots/2.03 mm x 2.03 mm (When enlarging basic print size: 36 x 36 dots/3.05 mm x 3.05 mm)
		Traditional Chinese BIG5(F): 13877 Taiwanese characters	
Emulation		StarPRNT	
Interface		USB-A x 1 Standard: USB2.0 Full-speed Embedded Host, USB BC1.2 SDP Power supply specifications: USB BC1.2 SDP (maximum 2.5 W)	
		USB-C x 1 Standard: USB2.0 Full-speed Device/Host, USB BC1.2 CDP, USB PD 3.2 Ver.1.0 Power supply specifications: USB PD (maximum 20 W), USB-C Current (maximum 15 W), USB BC1.2 CDP (maximum 7.5 W), iAP2 (maximum 15 W)	
		Wired LAN (Ethernet) x 1 Standard: 10Base-T/100Base-TX (IEEE 802.3/IEEE 802.3u)	
		Wireless LAN [Wireless model only] Standard: 2.4 GHz: IEEE802.11b/g/n/ax, 5 GHz: IEEE802.11a/n/ac/ax Operating mode: Access point mode / Infrastructure mode.	
		Bluetooth Classic [Wireless model only] Standard: Bluetooth V5.0 Classic (BR/EDR), class 2, iAP2 supported	
		Bluetooth Low Energy [Wireless model only] Standard: Bluetooth V5.3 * Used only for printer settings	
Sensor	Head temperature	If the temperature of the thermal head becomes high, printing stops temporarily, lowering the temperature of the head.	
	Temperature of printed circuit board	If the temperature of the printed circuit board becomes high, printing stops temporarily, lowering the temperature of the board.	

Item		Specifications
	PE	Detects the trailing edge of paper (paper end = PE).
	BM	Detects black marks (BM) on the back of paper.
	GAP	Detects a gap between the labels of die-cut label paper.
	Hold print*4 [Standard model only]	Detects if the ejected paper is removed. This function can be enabled and disabled using Star Configuration or by panel operations.
	Cover open	Detects the opening/closing of the printer cover.
	Cutter home position [Standard model only]	Detects the home position of the cutter.
Auto cutter*5 [Standard model only]	Type	Guillotine type
	Cutting method	Partial cut (leaving one uncut portion at center), full cut
	Cut duty	3 sec/Cut
	Thickness	49 µm to 154 µm
Printer orientation*6		Laid on flat surface *The allowable angle range of the placement orientation is within $\pm 5^\circ$ in the horizontal direction.
External view	External dimensions	•When cover is closed 98 (W) x 185 (D) x 145.5 (H) mm •When cover is open 98 (W) x 290 (D) x 145.5 (H) mm  (Reference figure)
	Weight	Standard model: Approx. 1.6 kg LBL model: Approx. 1.4 kg
Withstand load		Approx. 2.0 kg (with respect to top surface of mC-Label2)
Reliability	Dust and drip proofing	Equivalent to IP22 (with cover installed)
	Insect proofing	Design incorporates consideration for insect proofing.

[Notes on general specifications]

Note *1) Printing specifications

<Print speed>

Print mode	Maximum speed
During high speed mode	Maximum 180 mm/sec
During medium speed mode	Maximum 140 mm/sec
During slow speed mode	Maximum 100 mm/sec

- 1) The print speed listed above are achieved under the conditions of the power supply voltage at 24 V, the ambient temperature at 25°C, and the print density setting at default.
- 2) The print speed will automatically change depending on conditions, such as power supply voltage fluctuations, the ambient temperature of 25°C, printing density, and printing pattern.
- 3) The print speed may slow down depending on conditions such as the data transfer speed and print pattern.
- 4) If the printing speed is high, uneven printing may occur. To prevent this, reduce the printing speed.
- 5) If the print at the leading edge of the paper is jammed, feed approximately 1 mm of paper at the beginning of the print.

<Print width>

- 1) The print width can be changed by using Utility or Star Configuration.
- 2) If the print area is set wider than the paper width, the actual life of the thermal head may become shorter than specified.

<Paper width, roll diameter>

The paper widths and roll diameters that can be used vary depending on the paper specifications which are used.
For details, see "2.2 Paper specifications".

<Length of printing paper>

The minimum length of printing paper is 21.0 mm.

When sending print data with the length of printing paper to be cut is less than 21.0 mm, unloaded feed is performed automatically so that the length of printing paper becomes 21.0 mm or more.

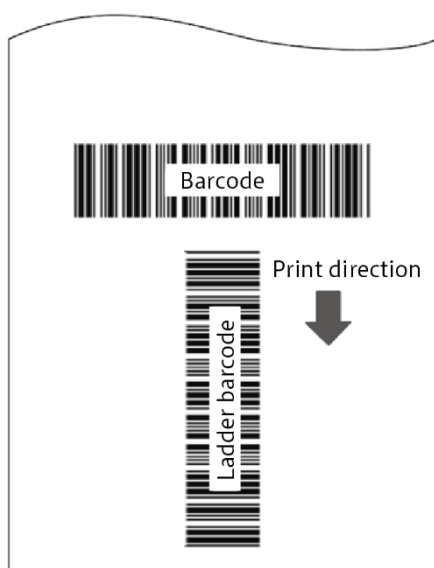
<Top margin>

- 1) The default is 3 mm. For behaviors with each media type, see "2.4 Media settings".
- 2) If the paper is left loaded with the printer power ON, the top margin of the first sheet to be printed next may be longer than the set value due to the paper sticking prevention operation inside the printer. If this behavior interferes with operation, leave the printer cover open when not using the printer for a certain period.

Note *2) Barcode

- 1) 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, and the print density and print speed settings.
When you read the printed barcodes using a scanner or other types of device, we strongly recommend that you evaluate the data scanning quality beforehand.
- 2) If you cannot obtain the desired scanning quality with your scanner, try to reduce the print speed, increase the size of the minimum module, or change the barcode length. These adjustments may improve the barcode scanning quality.
Additionally, when printing barcodes, please ensure to provide adequate margin (quiet zone) around them so that scanning is not affected.
- 3) If you use GS1 Composite Symbols, we recommend that you adjust the size that can be read by the scanner and evaluate the data scanning quality beforehand. If you release the scanner to widen the scan area, it may be difficult to attain a satisfactory scanning result.
- 4) When printing 2D barcodes, synthetic barcodes, or ladder barcodes by using a command, if the print speed setting is high speed, it will be forcibly changed to medium speed.

Barcode type		Barcode		Ladder barcode	
		Module size	Print speed	Module size	Print speed
1D		3 dots (10 mil) or more	No limitation	4 dots (13.3 mil) or more	Medium speed or less
2D	PDF, GS1	3 dots (10 mil) or more	Medium speed or less	4 dots (13.3 mil) or more	Medium speed or less
	QR	3 dots (10 mil) or more	Medium speed or less	4 dots (13.3 mil) or more	Medium speed or less
Composite		3 dots (10 mil) or more	Medium speed or less	4 dots (13.3 mil) or more	Medium speed or less



Barcode : Barcode in which the direction of the bars are arranged parallel to the printing direction

Ladder barcode : Barcode in which the direction of the bars are arranged vertically to the printing direction

Note *3) Fonts

<Basic print size>

- 1) The basic print size can be enlarged to 1.5 times vertically and 1.5 times horizontally using commands or various SDKs.
By enlarging the basic print size, it is possible to print ANK characters and kanji characters with approximately the same font size as a printer with a head resolution of 203 dpi. For details, refer to the Command Specifications or various SDK manuals.

<Kanji>

- 1) Font settings can be changed by using Utility or Star Configuration.
For Japanese kanji characters, the JIS level-1 kanji characters and the JIS level-2 kanji characters are compliant with JIS x0208-1990/1997.
Level-1 and level-2 JIS2004 sample character style and SHIFT-JIS code are supported.
- 2) Chinese characters (compliant with GB18030) support 2 byte and 4 byte codes.

<UTF-8 support>

- 1) Chinese characters and Latin-script alphabet with UTF-8 code are supported.
- 2) Characters printable in UTF-8 code are Latin-script alphabet, including the code page held by the printer, and the following types of Chinese characters.
 - Japanese kanji characters
 - Chinese characters (compliant with GB18030): 2-byte codes
 - Traditional Chinese BIG5
 - Hangul characters
- 3) For 4-byte code Chinese characters conforming to GB18030, UTF-8 is not supported. The non-supported code is printed with "□".
- 4) The selection between the conventional kanji code and the UTF-8 code can be made by a command or by Star Configuration.

Note *4) Hold print sensor[Standard model only]

- 1) When continuous printing is performed on the linerless label, a label may stick to the printer or mounting surface, resulting in a paper jam. To prevent this, the hold print function is provided.
- 2) The settings of hold print can be changed by using Star Configuration or the Star Quick Setup Utility. (It is enabled in the factory setting.)
It is recommended to keep the hold print sensor function enabled (factory default setting) to prevent a paper jam in 1).
When continuous printing is performed, disable this function and be sure to sufficiently verify the operation before use.
- 3) If the media settings were changed, this sensor will automatically change to the recommended settings for that media. For details, refer to "9 Star Configuration Format" and "2.4.1 Non-recommended settings".
- 4) When the hold print sensor is enabled and the paper has not been removed from the printer, printing will not start even when the next printing is selected. In this case, remove the paper. Printing will start.
- 5) When the hold print sensor is enabled, it is recommended to implement a system that confirms the hold print status from the application and stops the print command when in the hold print status.
- 6) You can configure the hold print time settings.

Note *5) Auto cutter [Standard model only]

1) If an error occurs, open the printer cover, remove the cause of the error, then turn the printer back on to restore normal operation.

2) Remove the sheet after the cutting process is completed.

Removing the paper while it is being cut may cause failures, such as paper debris and paper jam.

Note) Opening the printer cover while cutting may damage the cutter.

3) Cutting position

The length from the cutting position to the print start position is approximately 10 mm.

4) The mechanical sensor detects errors in home position.

5) Switching between full cut and partial cut may not be performed properly depending on the type of paper used, the length of printing, the usage environment, etc.

Note*6) Installation position

1) Do not place the printer in an unstable location where the printer might be shaken.

2.2. Paper specifications

- Supported paper types

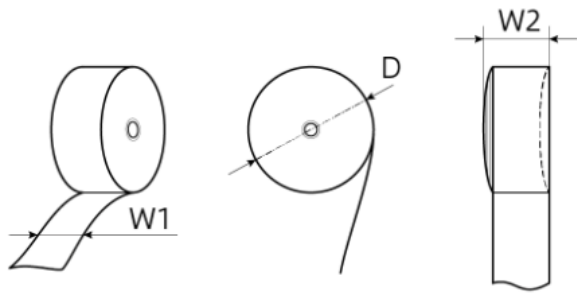
Standard model : Linerless label paper/Continuous label paper/Die cut label paper/Receipt paper

LBL model : Die cut label paper/Receipt paper

For the specifications of various types of paper, refer to the following.

- Note)
- 1) If the paper width is changed from a narrow setting to a wide setting during use, paper feeding and cutting may not be performed correctly. In this case, replace the cutter and platen. If printing does not work properly even after replacement, contact the dealer that you purchased the printer or your local distributor.
 - 2) If you change the type of paper during use, clean the head, cutter, platen, and feed path, because paper feeding, printing, and cutting may not be performed properly.
 - 3) Depending on the type of paper and the usage environment, perform a thorough evaluation and change the print density as necessary.
 - 4) Change the print density by using the print density setting command < ESC > < RS > 'd' n or Star Configuration.
 - 5) Adequate scanning results of barcodes or characters may not be attained because of factors such as the scanner, paper type, or print density. Be sure to evaluate your scanner with the printer in advance.
 - 6) For some printing contents, pitch deviation may occur at the start of printing depending on the type of paper.
When addressing this issue, change the top margin to 10 mm or perform empty feed before starting printing.
 - 7) Color streaks and wrinkles may occur depending on the type of paper or usage environment.
 - 8) Glue should not be used to secure the paper roll and the core. For linerless label paper, make sure that the label can be easily removed from the core.
Also do not fold the trailing edge of the paper.
If the trailing edge of the paper is glued to the core or folded, replace the paper roll before using it up.
 - 9) If there is slack in the paper, paper wrinkling or folding of edge may occur. In this case, remove the slack of the paper and reload the paper.
 - 10) Depending on how the paper is loaded, the paper surface may become scratched. If printing is affected immediately after replacing paper roll, test print a few sheets to confirm that there are no problems before using.

2.2.1. Linerless label paper [Standard model only]



- | | |
|-------------------------|---|
| (1) Paper width [W1] | : 39.5 ±0.5 mm to 57.5 ±0.5 mm |
| (2) External dimensions | : Winding diameter (Maximum roll diameter) [D] ... φ102 mm
Roll width (Wrap-up dimensions) [W2] ... Paper width [W1] +1, -0.5 mm |
| (3) Paper thickness | : 68 μm to 93 μm |
| (4) Core inner diameter | : φ25.4 mm or more |
| (5) Paper media | : Use the paper that your local distributor handles. For details of the paper that meets the specifications in this document, contact your local distributor listed below.
https://www.star-m.jp/mclabel2-sup.html?a4 |

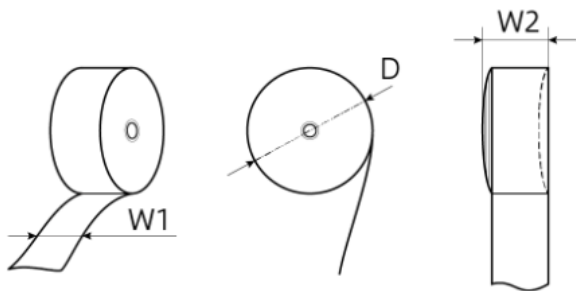
2.2.2. Die cut label paper

- (1) Mount width : 24.5 ±0.5 mm to 59.5 ±0.5 mm
- (2) External dimensions : Winding diameter (Maximum roll diameter) ... φ102
- (3) Paper thickness : 154 μm or less (total thickness)
- (4) Core inner diameter : φ25.4 or more

2.2.3. Continuous label paper [Standard model only]

- (1) Paper width : 24.5 ±0.5 mm to 59.5 ±0.5 mm
- (2) External dimensions : Winding diameter (Maximum roll diameter) ... φ102
- (3) Paper thickness : 154 μm or less (total thickness)
- (4) Core inner diameter : φ25.4 or more

2.2.4. Receipt paper



- (1) Paper width [W1] : 57.5 ±0.5 mm
- (2) External dimensions : Winding diameter (Maximum roll diameter) [D] ...
 - φ83 *If paper thickness is less than 100 μm
 - φ102 *When paper thickness is 100 μm or moreRoll width (Wrap-up dimensions) [W2] ... Paper width [W1] +1, -0.5 mm
- (3) Paper thickness : 49 μm to 150 μm
- (4) Core inner diameter : φ12 mm or more *When paper thickness is less than 85 μm
φ25.4 or more *When paper thickness is 85 μm or more

2.3. Environmental specifications

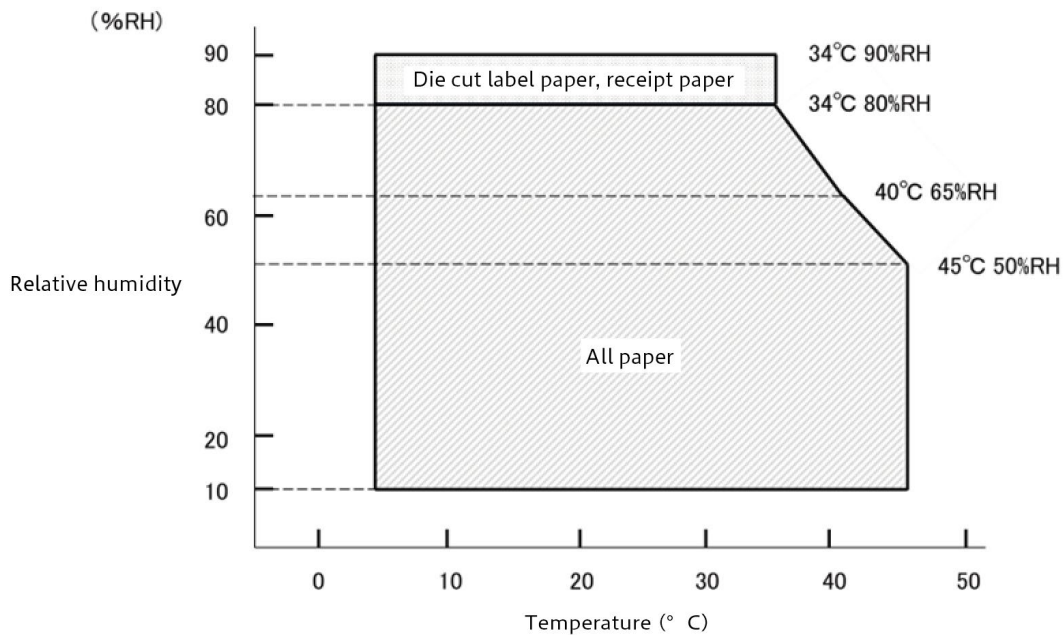
2.3.1. Printer operating environment

Temperature : 5°C to 45°C

Humidity : 10% RH to 90% RH (No condensation) *Die cut label paper, receipt paper

: 10% RH to 80% RH (No condensation) *Linerless label paper, continuous label paper

(Refer to the following diagram for the relationship between temperature and humidity.)



The correlation between operating temperature and humidity

Note 1) The operating environment must be compliant with the specifications of the paper used.

2.3.2. Printer storage environment

Temperature : -20°C to 60°C

Humidity : 10% RH to 90% RH (No condensation)

Note 1) The worst combination of high temperature and humidity is 40°C and 90% RH (no condensation).

2) The storage environment is recommended to be 30°C 60% or less because the performance of the platen roller varies depending on the humidity environment.

2.4. Media settings

When the media type is selected using a utility or other means, the settings are automatically changed to the printer recommended settings for that media. For LBL models, only the die cut label paper and the receipt paper can be set. Refer to the following table for the details of setting changes.

		Printer settings linked with the media settings							
Factory defaults		Media type	Cutter	Mark detection	Mark detection sensor	Hold print control	Print density	Top margin	Parts cleaning Parts replacement
Standard	LBL								
✓		Linerless label paper	Partial cut	Disabled	BM	Enabled	Standard	3mm	With notification
	✓	Die cut label paper	Command override	Enabled	GAP	Disabled	Standard	3mm	No notification
		Continuous label paper	Command override	Disabled	BM	Disabled	Standard	3mm	With notification
		Receipt paper	Command override	Disabled	BM	Disabled	-2	10mm	No notification

Note 1) You can change individual settings after changing the media settings.

However depending on the combination of media settings, there is the possibility of interference with printer operation.

For details, see "2.4.1 Non-recommended settings".

2) Media setting: Linerless label paper

For linerless label paper, it is recommended to operate by taking one sheet at a time using the hold print control.

If continuous printing of two or more sheets is desired, it can be achieved by disabling the hold print control. However, only switch after conducting sufficient operational testing in advance with the paper to be used.

3) Media setting: Die cut label paper or continuous label paper

It is recommended that the top margin setting be changed to 10 mm if a paper jam or folding of label paper occurs.

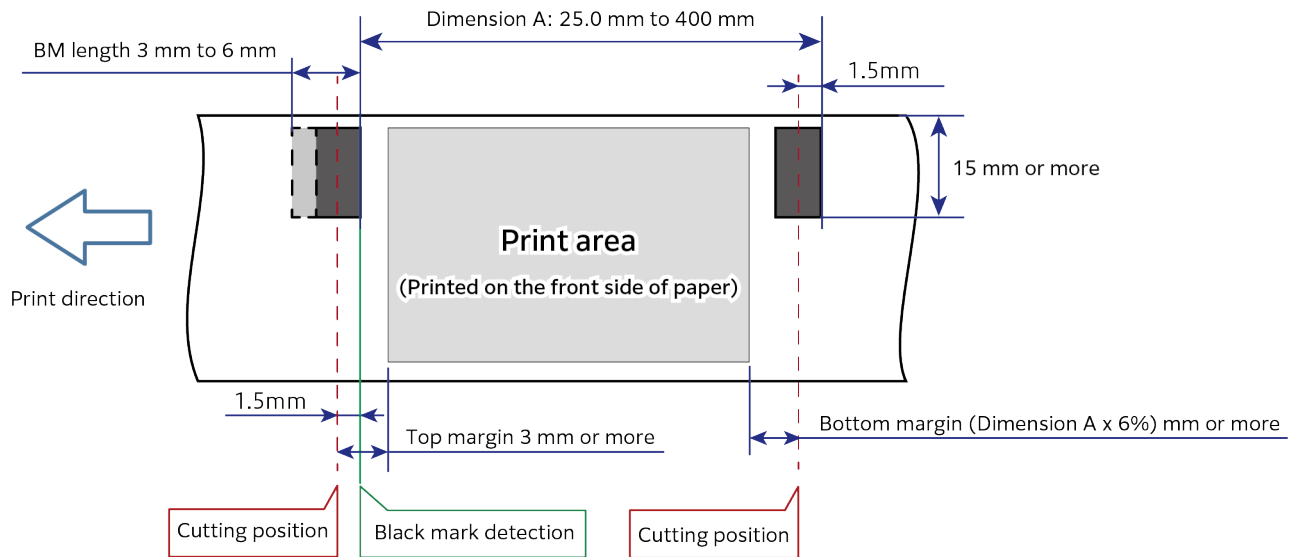
2.4.1. Non-recommended settings [Standard model only]

Depending on the combination of media and printer settings, there is the possibility of interference with printer operation as described below.

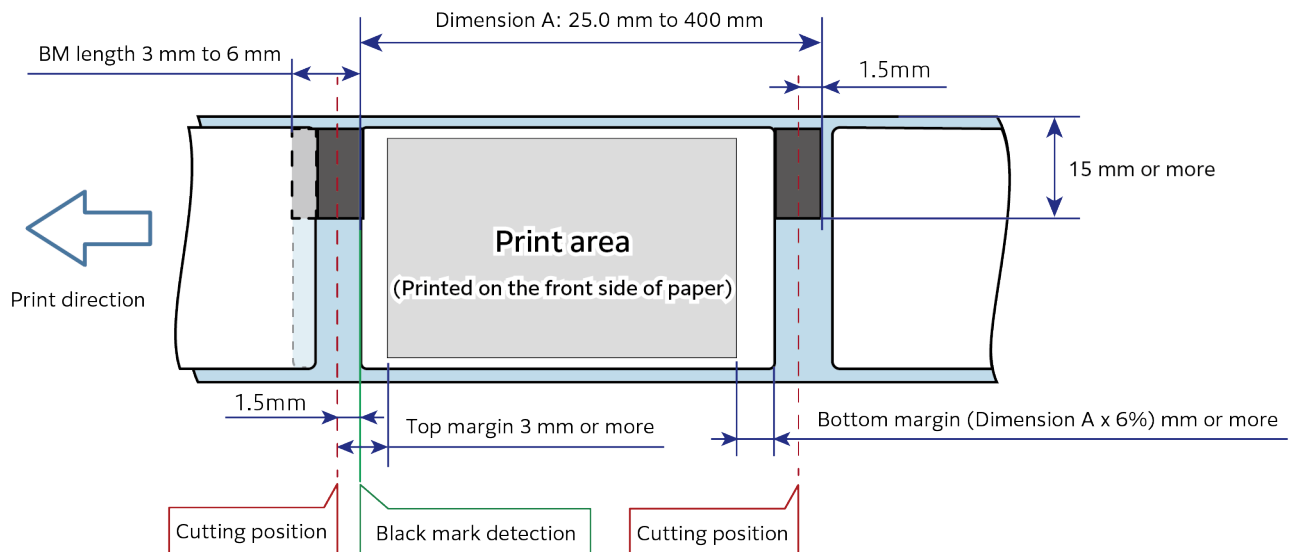
Please exercise caution when making the following settings.

Media type	Cut control	Hold print control	Top margin	Reason why not recommended
Linerless label paper	Partial cut	Disabled	-	When performing printing continuously with the hold print control disabled, label paper may stick near the printer exit, causing paper jam.
	Full cut	-	-	Fully cut label paper will not be held. Label paper may stick to the printer's surroundings or near the printer exit, causing paper jam.
Receipt paper	Partial cut	Disabled	3mm	Due to the margin reduction operation, cut receipt paper may come into contact inside the printer, potentially causing paper folding, tearing of uncut portion at center with partial cut, or paper jams.

2.5. Paper BM specifications



<Die cut label paper>



<Other than die cut label paper>

- Note
- 1) The default cutting position is at BM trailing edge - 1.5 mm. The cutting position can be adjusted.
 - 2) If you use pre-printed paper, do not execute pre-printing within the range where the BM sensor on the back side of the paper passes through. Additionally, carefully check the printer operation before starting printing.
 - 3) It is possible to adjust the position of the BM sensor in the paper width direction. There are no restrictions on the BM position in the paper width direction. See "2.5.1 Adjustment of BM sensor position" for how to adjust the position of the BM sensor.

(1) BM pitch (Dimension A)

The BM pitch may be set within a range of 25.0 to 400 mm.

Note 1) Set the print layout, taking into account the variation in print positions.

(2) BM length

Use paper with the BM length of 3 to 6 mm. BM error occurs if the BM length exceeds 9 mm.

The BM error detection length can be set in 9 to 24 mm and the default is 9 mm.

(3) PCS value

Set the PCS value of the BM to be printed to 0.90 or more.

Note 1) When measuring the OCS value, use the reflectance for a wavelength near the center of the sensor light wavelength range (940 nm) because the light source wavelength of our BM sensor is 940 nm.

2) If the PCS value of the BM does not meet the above specifications, pages may be skipped or page length detection failure may occur. Ensure that the PCS value meets the specifications, and carry out test printing before use.

(4) Top margin

It is recommended to set the print area with sufficient margin between the cutting position and the print start position.

(5) Bottom margin

When setting the print area, you need to set a sufficient bottom margin while considering the print accuracy for the BM pitch, the TOF accuracy (within ± 2 mm of the reference print position), the ambient temperature of the printer installation location, the wear of printer parts and other conditions, which can cause the print area to vary. As a guideline, it is recommended to secure a bottom margin of 6% or more of the BM pitch.

Note 1) If the bottom margin is not large enough, BM may not be detected and the page may be skipped.

2) Please ensure that the set value of print area does not exceed the BM pitch.

(6) Print area setting example

When BM pitch (Dimension A) is 100 mm and top margin is 3 mm:

Print area: BM pitch - Top margin - Bottom margin

⇒ Set so that the value does not exceed $100\text{ mm} - 3\text{ mm} - 100\text{ mm} \times 6\% = 91\text{ mm}$.

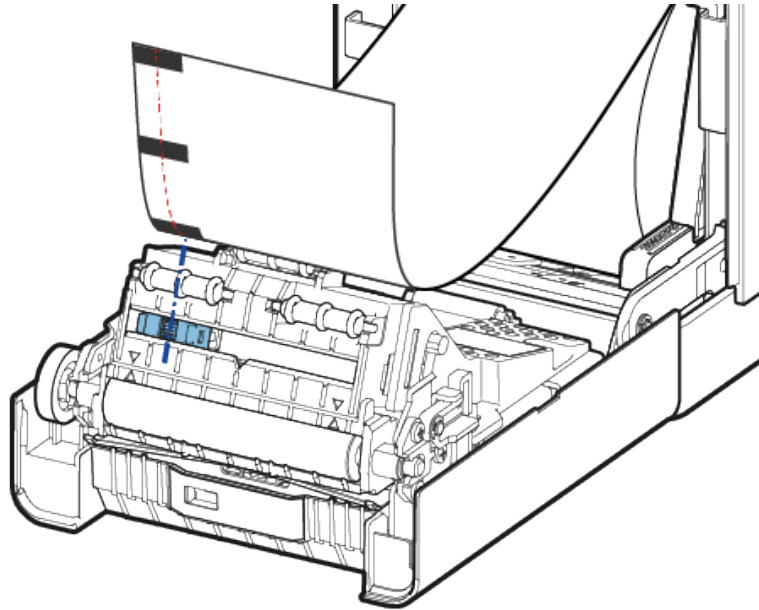
(7) Sensor adjustment

See "4.2 Multi-function button" for how to adjust the sensitivity of the BM sensor.

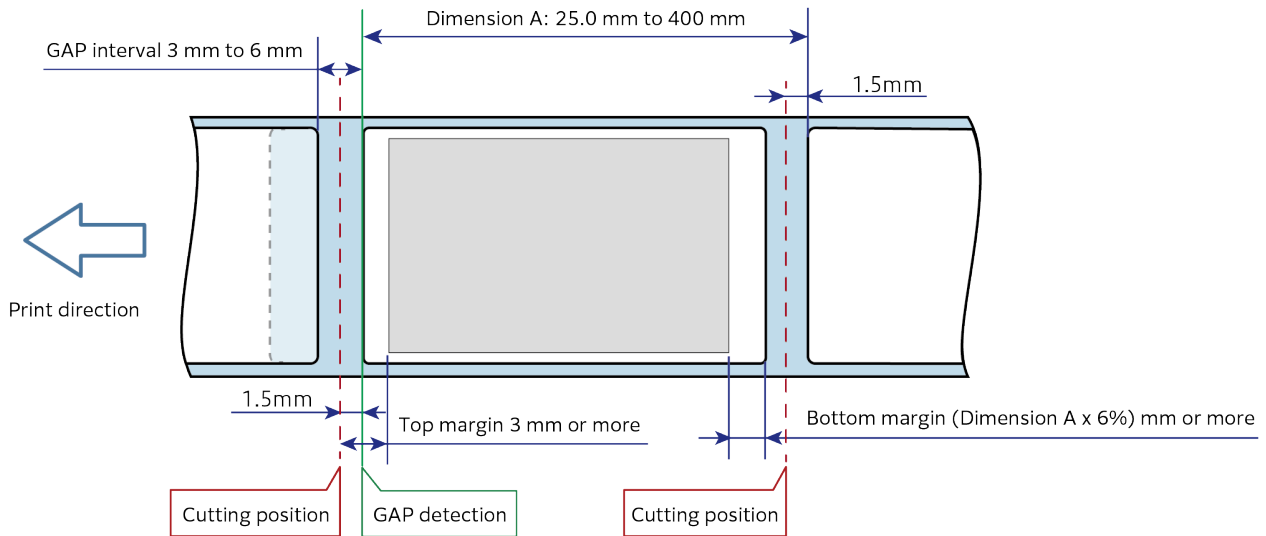
2.5.1. Adjustment of BM sensor position

Adjust the position of the BM sensor according to the BM position on the paper used.

1. Pull up the loaded paper, and check the BM position on the back of the paper.
2. Move and align the sensor with the center of the BM.



2.6. Paper GAP specifications



Note 1) The example settings for the top margin and print area are the same as those of the BM specifications.

For details, see "2.5 Paper BM specifications".

2) See "4.2 Multi-function button" for how to adjust the sensitivity of the GAP sensor.

(1) Label pitch (Dimension A)

It is possible to use paper with a label pitch ranging from 25.0 to 400 mm.

Note 1) Set the print layout, taking into account the variation in print positions.

(2) GAP interval

Use paper with the GAP interval of 3 to 6 mm. GAP error occurs if the GAP interval exceeds 24 mm.

The error threshold of 24 mm is a fixed value.

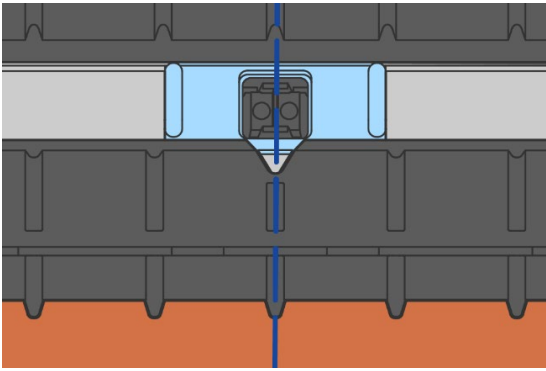
(3) Bottom margin

For the die cut label, the bottom margin is defined as the length from the end of the print area to the trailing edge of the label.

For other details, see "2.5 Paper BM specifications".

2.6.1. Adjustment of GAP sensor position

Be sure to position the GAP sensor as shown in the figure below (factory default) in order to detect the gap between the labels of die cut paper.



2.7. Notes on usage special-shaped die cut label paper

For die cut label paper with non-rectangular label shapes or with special liner shapes (hereinafter referred to as special-shaped die cut label paper), examples of labels that can be detected due to the printer's structure are listed below. Depending on the shape of the label and liner, proper operation may not be possible. When selecting die cut label paper, always pay attention to the notes below and carefully check the printer operation before starting printing. Be sure to observe the paper specifications in "2.5 Paper BM specifications" and "2.6 Paper GAP specifications" for the BM and GAP.

Adjust the position of the sensor according to the positions of BM and GAP of the paper used. For details, see "2.5.1 Adjustment of BM sensor position" and "2.6.1 Adjustment of GAP sensor position".

- Note 1) Depending on the shape of the label paper or liner, the label paper may separate from the liner during paper feeding, causing paper jam. Be sure to perform full operation checks in advance.
- 2) If the BM and GAP are not detected correctly, adjust the sensor.
For details, see "4.2 Multi-function button".

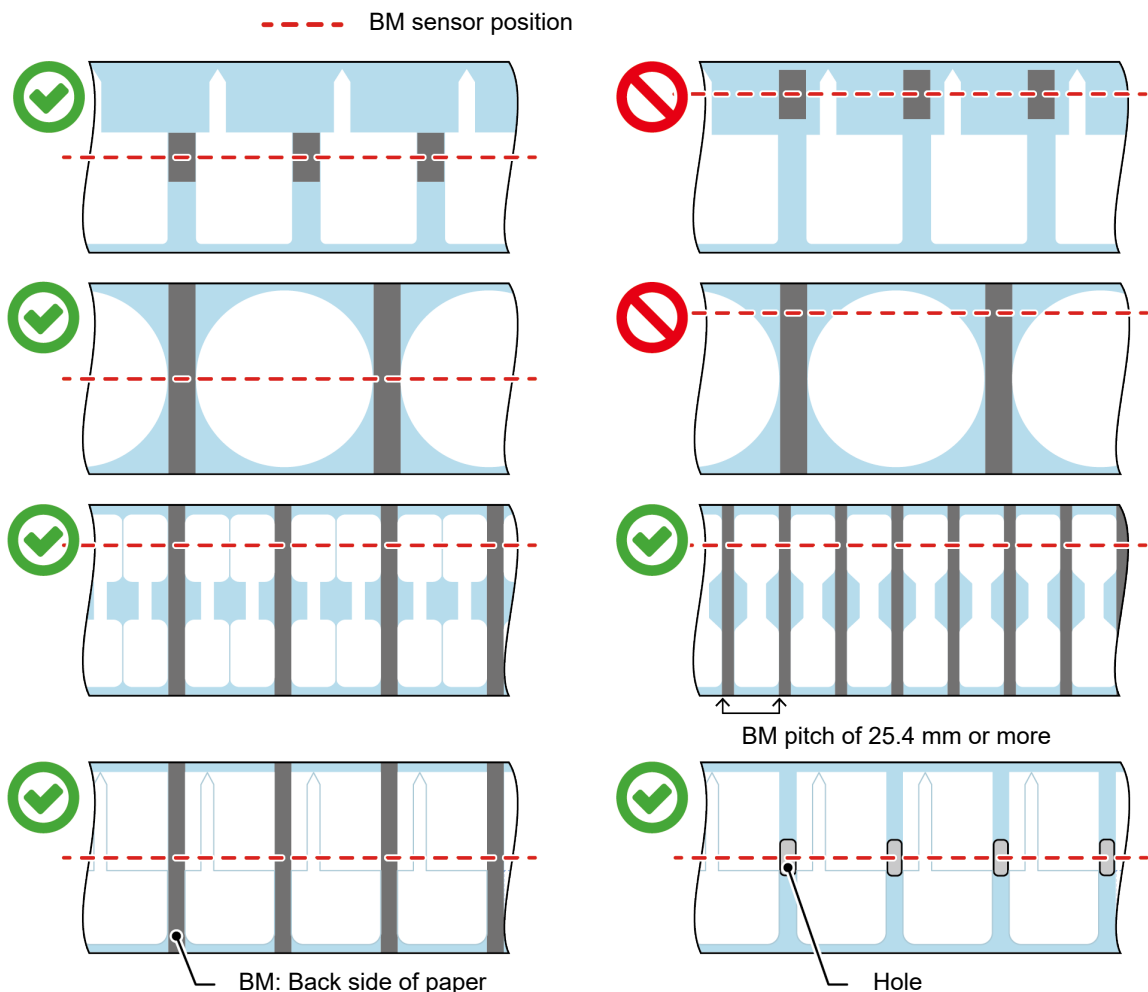
2.7.1. Example usage of special-shaped die cut label paper

<When using the BM sensor>

For the BM paper, use paper where there is no gap between the label paper and the BM (liner is not visible).

When the BM detection is enabled, if the BM sensor passes through an area where there is only the liner, it may be incorrectly judged that there is no paper, potentially causing print stoppage or failure to cut at the correct position.

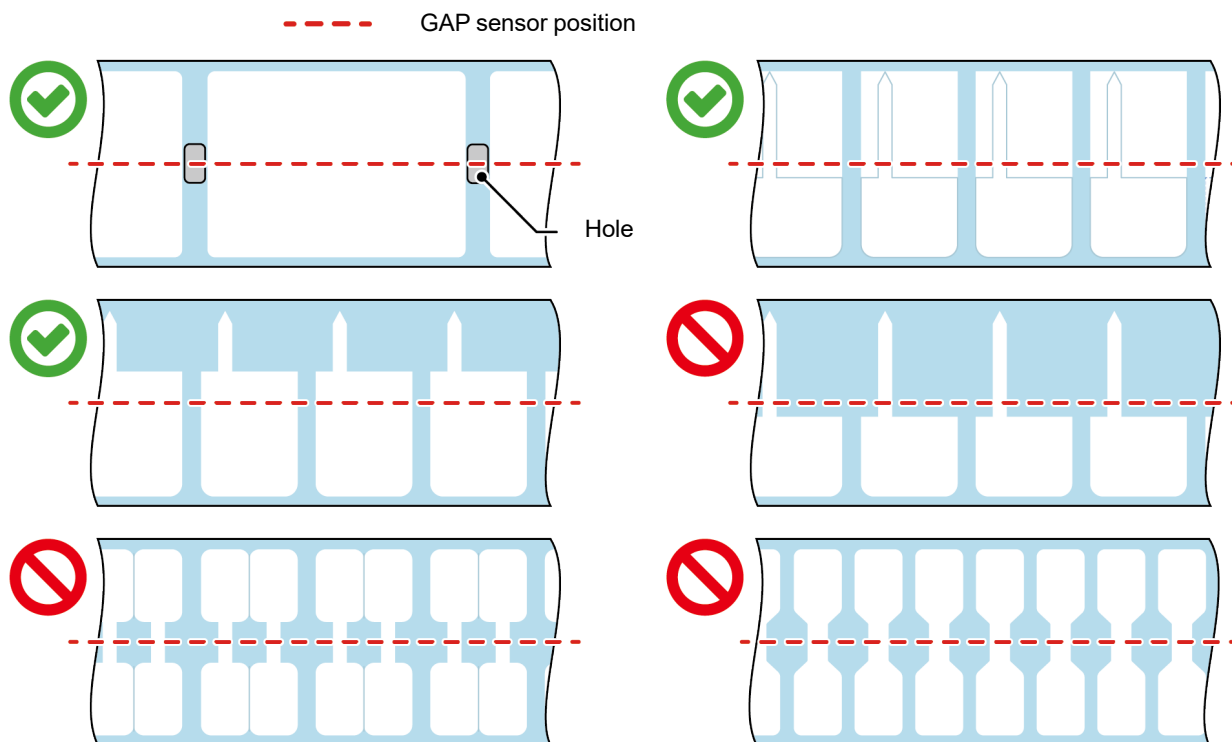
Adjust the position of the BM sensor as needed.



<When using the GAP sensor>

For the GAP interval, use paper that satisfies the specifications described in "2.6 Paper GAP specifications" for the center of paper where the GAP paper passes. If paper with a GAP interval outside the specification in the center, or with a GAP existing at a position other than the cutting position is used, there may be cases where the paper cannot be cut at the correct position.

When the BM detection is enabled, if the BM sensor passes through an area where there is only the liner, it may be incorrectly judged that there is no paper, potentially causing print stoppage or failure to cut at the correct position.



2.8. Power specifications

(1) Printer input specifications

- Operating voltage : 24 VDC $\pm$ 10%
- Rated power (Safety certification ID label) : 24 Vdc. 2.7 A

(2) Current consumption

at 24 VDC, room temperature, without USB power supply

- During power ON idling : Approx. 0.08 A (average)
- During ASCII printing : Approx. 1.5 A (average)

* Use the provided PS65AT-24A power adapter.

When performing continuous high-duty printing, limit it to a maximum of 3 seconds and perform sufficient operation testing.

(3) Power connector

- Power connector pin arrangement

Pin No.	Function
1	+24V
2	GND
3	N.C
Shell	Frame GND

- Model number : TCS7960 (HOSHIDEN) or equivalent
- Other party : TCP8927 (HOSHIDEN) or equivalent

(4) Specifications of the power adapter packaged with the printer

PS65AT-24A

- Input rating : 100-240 VAC $\pm$ 10%, 1.4 A, 50-60 Hz
- Output rating : 24.0 VDC $\pm$ 5%, 2.71 A

(5) Recovery from power failure

The printer can store the power ON/OFF status prior to power failure.

If a power failure occurs while the power is ON, the printer will recover to the power ON status after power has been restored.

(If a power failure occurs while the power is OFF, the power will remain OFF.)

(6) Notes

<Preparing power on the user side>

When the power supply is to be prepared on the user side for the printer, please note the following points.

- Use a power supply that is 24 VDC $\pm$ 10% and 2.7 A or more.
- Select a power supply with current capacity that is appropriate for the actual printing ratio.
- Use a power supply that is SELV output and conforms to either LPS (Limited Power Source) or Class 2.
- Use the power supply that meets the EMC standards for the country or region in which you are setting up the printer.

2.9. Reliability specifications

2.9.1. Life

(1) Printer service life : 30 million lines of printing

<Notes>

- 1) The printer service life is the value when printing is repeated with a feed of 1 line = 2.71 mm.
- 2) The service life of the printer does not apply to the following parts:
 - MCL21 : Cutter, platen, thermal head
 - MCL21LBL : Thermal head

(2) Thermal head service life : 30 km (20 million pulses) •••Linerless label paper (Adhesive type: Strong adhesive)

75 km (50 million pulses) •••Linerless label paper (Adhesive type: Weak adhesive)

100 km (67 million pulses) •••Other than linerless label paper

*Printing conditions: Average printing ratio:

12.5%, Head average resistance value change rate $\pm 15\%$ or less

<Notes>

- 1) The service life is based on the standard according to our company's own evaluation under normal temperature and humidity.
- 2) The service life is a representative value.
- 3) The end of the head's life is defined as the point when two or more adjacent dots are damaged. However, this does not include scratches caused by external materials being affixed to the head or accidental damage caused by the user.
- 4) When printing is repeatedly performed at an extremely high printing rate, the life of the thermal head may decrease drastically. Therefore, you must carefully plan the print formats that will be used.

(3) Cutter service life

Standard model : 200,000 cuts	•••Linerless label paper (Adhesive type: Strong adhesive)
One million cuts	•••Linerless label paper (Adhesive type: Weak adhesive)
One million cuts	•••Die cut label paper (liner portion)
500,000 cuts	•••Continuous label paper
One million cuts	•••Receipt paper

<Notes>

- 1) The service life is based on the standard according to our company's own evaluation under normal temperature and humidity.
- 2) The service life is a representative value.

(4) Platen roller service life

Standard model	: 10 km	•••Linerless label paper (Adhesive type: Strong adhesive)
	50 km	•••Linerless label paper (Adhesive type: Weak adhesive)
LBL model	: Not applicable (incorporated in mechanical parts life)	

<Notes>

- 1) The service life is based on the standard according to our company's own evaluation under normal temperature and humidity.
- 2) Depending on the usage environment, you may need to replace the platen roller if label clogging occurs frequently, even if the platen roller has not reached the specified service life.
- 3) Performance varies depending on the humidity environment. Therefore, the actual service life may become shorter than specified.
- 4) The service life above is a representative value.
- 5) Since the performance of the platen roller changes over time, it is recommended to replace the parts every one to two years.

2.9.2. MCBF

(1) MCBF : 55 million lines

MCBF is defined as a general interval of failures, including random failures and wear-out failures, that occurs before the printer service life of 30 million lines is reached. (* The service life of this printer is 30 million lines, and the MCBF value above does not refer to durability life.)

2.9.3. MTBF

(1) MTBF : 360,000 hours

MTBF is defined as the average time between the failures of the systems, including the circuit system, while random failures occur.

(* MTBF is a reliability index, and the operation of duration above is not guaranteed.)

2.9.4. Shocks from vibration and falling

(1) Vibration (when packaged)

- Test method : Sine wave vibration test
- Direction of vibration : X, Y, and Z
- Vibration frequency : 7 Hz to 100 Hz
- Sweep time : Logarithmic frequency sweep rate, 15 minutes for reciprocation
- Vibration acceleration : 1.5 G, constant
- Application time : 1 hour (Total 3 hours)
- Packaging : Minimum packaging
- Criterion : Destruction of the device, with no parts missing
Cracking and deformation of packaging and cushioning material shall be acceptable.

(2) Drop shock (when packaged)

- Drop height : 60 cm
- Direction of drop : 1 angle, 3 corners, 6 surfaces
- Number of drops : One time each (Total of 10 drops)
- Packaging : Minimum packaging
- Criterion : Destruction of the device, with no parts missing
Cracking, detachments, and deformation of packaging and cushioning material shall be acceptable.

(3) Drop shock (when not packaged)

- Drop height : 5 cm
- Direction of drop : 4 sides and side supports
- Number of drops : One time each
- Criterion : Destruction of the device, with no parts missing

2.9.5. Noise

- Measurement standard : JIS X 7779 (ISO 7779)
- When operating : A-weighted sound pressure level

standard model	approx. 54 dB
LBL model	approx. 55 dB

The above noise level is based on Star Micronics evaluation conditions that comply with JIS X7779.

The noise levels will vary depending on the paper that you use, the contents that you are printing, and the settings (media settings, print speed, print density) that you have made.

2.9.6. Dust and drip proofing

Dust-proof/Drop-proof performance Equivalent to IP22

<Notes>

- 1) Based on JIS C 0920 (IEC 60529), this is the result of evaluation by a third-party evaluation organization, and does not guarantee the conformity to the standard, no damage, and no failure.
- 2) Tests are conducted with all the covers installed and closed.

3. Communication Specifications

3.1. Network interface

3.1.1. Wired LAN (Ethernet) interface

(1) Communication specifications : 10Base-T/100Base-TX

(2) Connector : RJ-45 (8P8C)

Use the supplied cable or category 5 or higher cable.

(3) Setting items

The wired LAN settings are as shown in the table below. The contents of settings can be checked by self-printing. For the self-printing procedure, see "4.2.3 Self-printing mode".

To change settings, use Web Configuration, Star Configuration, or Star Quick Setup Utility.

Setting item	Input range	Initial value	Remarks
IP Address	0.0.0.0 to 255.255.255.255	0.0.0.0	
Subnet Mask	0.0.0.0 to 255.255.255.255	0.0.0.0	
Default Gateway	0.0.0.0 to 255.255.255.255	0.0.0.0	
DHCP	ENABLE / DISABLE	ENABLE	

3.1.2. Wireless LAN interface

This section applies to wireless LAN-compatible models only.

For the compatible models, see items in "2.1 General specifications".

3.1.2.1. Wireless LAN specifications

IEEE802.11a/b/g/n/ac/ax (2.4 GHz, 5 GHz)

1-stream (1T1R)

Operating frequency : 2.4 GHz 2,412 to 2,472 MHz
: 5 GHz 5,180 to 5,825 MHz

Channel width : 20 MHz

Frequency interval : 2.4 GHz 5 MHz
: 5 GHz 20 MHz

Modulation type : 11b DSSS (DBPSK, DQPSK, CCK)
: 11a/g/n OFDM (BPSK, QPSK, 16QAM, 64QAM)
: 11ac/ax OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

Encryption : RC4 128 bits
: AES 128 bits

Country/region settings : The table at the bottom of this section shows the details on the frequency bandwidth set to the channel and transmission power in compliance with the radio laws in each country or region for the location of use of each model name.

Standard for communicable distance (*1) : 30 m

Interference distance : 40 m

(*1) This is the distance that has been tested for operation.

However, there should be no obstacles between the host device and printer and their surrounding areas that interfere with communication.

In addition, since the communication distance varies depending on the surrounding reception environment, obstacles, installation environment, etc., an evaluation should be thoroughly performed at the time of setup.

<Frequency bandwidth details>

Wireless LAN channel setting Location of use	Supported channels
C01 Location of use: US	[2.4GHz] 1 to 11 ch [5GHz] W52 (36,40,44,48 ch) (*1) W53 (52,56,60,64 ch) W56 (100,104,108,112,116,132,136,140 ch) W58 (149,153,157,161,165 ch) (*1) Outdoor use prohibited (Canada)
C02 Location of use: E+U	[2.4GHz] 1 to 13 ch [5GHz] W52 (36,40,44,48 ch) (*2) W53 (52,56,60,64 ch) (*2) W56 (100,104,108,112,116,120,124,128,132,136,140 ch) W58 (149,153,157,161,165 ch) (*2) Outdoor use prohibited (EU, UK)
C03 Location of use: JP	[2.4GHz] 1 to 13 ch [5GHz] W52 (36,40,44,48 ch) (*3) W53 (52,56,60,64 ch) (*3) W56 (100,104,108,112,116,120,124,128,132,136,140,144 ch) (*3) Outdoor use prohibited (Japan)
C04 Location of use: AS, SAxx	[2.4GHz] 1 to 13 ch [5GHz] W52 (36,40,44,48 ch) (*4) W53 (52,56,60,64 ch) (*5) W56 (100,104,108,112,116,132,136,140 ch) W58 (149,153,157,161,165 ch) (*4) Outdoor use prohibited (Australia, New Zealand) (*5) Outdoor use prohibited (Australia)

* Access point mode does not support W53 and W56 with 5 GHz.

3.1.2.2. Wireless LAN setting items

Available setting items vary depending on the wireless LAN communication mode as shown in the table below.

• Common setting items

Setting item	Input range	Initial value	Remarks
Wireless LAN function	ENABLE	ENABLE	
	DISABLE		
Wireless communication mode	Access point Infrastructure	Access point	
Auto reset function	ENABLE	ENABLE	
	DISABLE		

• Setting items for access point mode

Setting item	Input range	Initial value	Remarks
SSID (*1)	1- to 32-byte character string	mC-Label2-XXXXXX (XXXXXX is the last 6 digits of MAC address)	
Security Type	NONE WPA WPA2 WPA3	WPA2	
Security Key (*2)	8- to 63-byte character string or 64-digit hexadecimal number	Product serial number	
Frequency	2.4GHz 5GHz	2.4GHz	
Channel	Varies depending on the frequency or channel table settings	1	
IP address	192.168.10.1 (fixed)	192.168.10.1	
Subnet Mask	255.255.255.0 (fixed)	255.255.255.0	
Default Gateway	0.0.0.0 (fixed)	0.0.0.0	
DHCP	DISABLE (fixed)	DISABLE	

(*1) Multi-byte characters (kana and kanji characters) cannot be used.

(*2) ASCII strings between 8 to 63 characters or 64 hexadecimal digits can be used.

In the case of 64 hexadecimal digits, the usable characters are numbers 0 to 9 and letters a to f. \The entered characters are not case sensitive.

• Setting items for infrastructure mode

Setting item	Input range	Initial value	Remarks
SSID (*1)	1- to 32-byte character string	-	
Security Type	NONE AUTO WPA WPA2 WPA3	-	
Security Key (*2)	8- to 63-byte character string or 64-digit hexadecimal number	-	
IP address	0.0.0.0 to 255.255.255.255	0.0.0.0	
Subnet Mask	0.0.0.0 to 255.255.255.255	0.0.0.0	
Default Gateway	0.0.0.0 to 255.255.255.255	0.0.0.0	
DHCP	ENABLE DISABLE	ENABLE	

(*1) Multi-byte characters (kana and kanji characters) cannot be used.

(*2) ASCII strings between 8 to 63 characters or 64 hexadecimal digits can be used.

In the case of 64 hexadecimal digits, the usable characters are numbers 0 to 9 and letters a to f. The entered characters are not case sensitive.

3.1.2.3. Wireless LAN easy setup

To use the wireless LAN function of this product, change the setting to enter infrastructure mode and connect to the access point.

The following three setting change methods, as mentioned in "8.2 Software" are available: Star Quick Setup Utility, Web Configuration, and Star Configuration, all of which are configurable through simple operations.

Web Configuration can be easy accessed according to "3.1.2.3.2 Connecting to the printer via wireless LAN by scanning the QR code" and "3.1.2.3.3 Automatic access to Web Configuration using Captive Portal".

3.1.2.3.1. Setting using Star Quick Setup Utility

To perform a setup, use a Bluetooth Low Energy-compatible smartphone or tablet, and select [For New Users (Initial Setup)] > [Use Wireless LAN] from Star Quick Setup Utility.

3.1.2.3.2. Connecting to the printer via wireless LAN by scanning the QR code

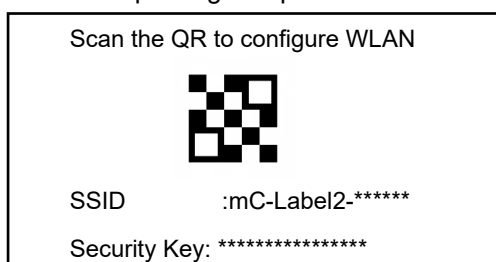
Wireless LAN connection to the printer is easily possible by scanning the QR code at startup in access point mode.

Scan the QR code for connection using the standard camera app or QR code reader app of the device.

The QR code for connection is printed under one of the following two conditions:

- 1) Executing self-printing (not printed if wireless LAN function is disabled)
- 2) Automatic printing when all of the following apply 20 seconds after startup:
 - Wireless LAN function is not disabled
 - The printer is running in access point mode.
 - No LAN cable is connected.
 - No device is connected to the USB-A port or USB-C port.
 - There is no Bluetooth pairing history.
 - Self-printing is not executed.

QR code printing sample



* SSID and Security Key are not printed in this position when self-printing is executed.

3.1.2.3.3. Automatic access to Web Configuration using Captive Portal

To make it easy to configure the network settings, this product has a function (Captive Portal function) to automatically access Web Configuration after a wireless LAN connection to the printer in access point mode is established.

* Automatic access to Web Configuration may not be possible depending on the device you are using.

3.1.2.4. Wireless LAN communication mode

This product supports access point mode and infrastructure mode.

By default, the product starts in access point mode when the power is turned on (factory settings).

3.1.2.4.1. Access point mode

Since the settings of the product where wireless LAN has not been configured are changed via Web Configuration, the product serves as an access point.

The product functions as a DHCP server in access point mode with the following parameters.

DHCP Lease Time	24 hours	: Fixed
Starting address assigned by DHCP	192.168.10.2	: Fixed
Number assigned by DHCP	Max 8	: Fixed

3.1.2.4.2. Infrastructure mode

When you set the wireless LAN setting items via Web Configuration, Star Configuration, or Star Quick Setup Utility, the settings are saved in the non-volatile memory. Upon the next power ON, the printer will start in infrastructure mode and automatically connect to the access point based on the saved settings.

3.1.2.5. Wireless LAN troubleshooting function

This product has a wireless connection diagnosis function to identify a problem and assist the action to take next in the event of trouble, such as the printer being unable to connect to wireless LAN.

3.1.2.5.1. Troubleshooting using Star Quick Setup Utility

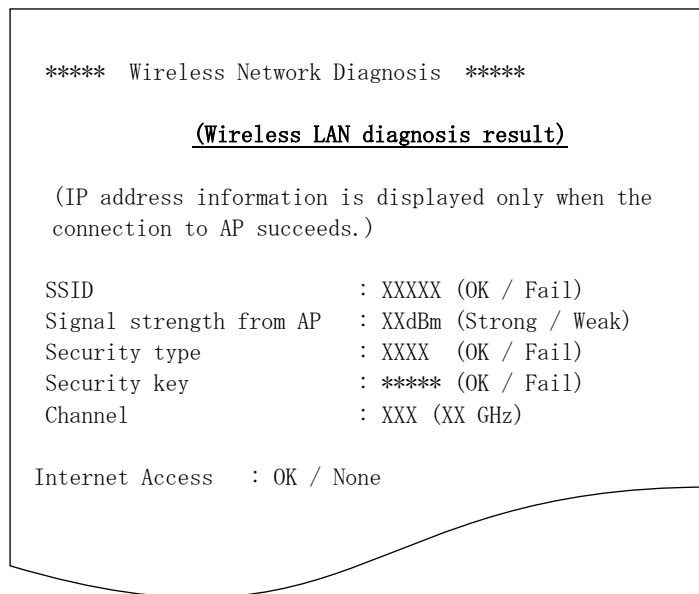
To perform a wireless LAN connection diagnosis, select [Verify Printer Operation] > [Troubleshoot Wireless LAN] from Star Quick Setup Utility iOS/Android, mentioned in "8.2 Software", using a Bluetooth Low Energy-compatible smartphone or tablet.

3.1.2.5.2. Wireless LAN connection diagnosis print function

This product has a function to diagnose whether a connection from the product to an access point has succeeded or failed.

The wireless LAN connection diagnosis result can be confirmed in the following self-print.

Connection diagnosis result printing sample



If "(Fail)" is listed for the SSID, security type, or security key, the connection failed because there is an error in that item. To correct it, refer to the wireless LAN diagnosis result field.

If the wireless LAN connection succeeds, Internet connection availability is determined and printed.

3.1.2.6. Auto reset function

If the product fails to connect to the access point, such as when you change the wireless LAN settings with the auto reset function set to ENABLE and enter a wrong SSID or Security Key, turning off and back on the power restores the wireless LAN settings from the time of factory shipment.

This function is set to ENABLE in the factory default settings.

3.1.3. Wired LAN (Ethernet) and wireless LAN interface common functions

Basic functions

3.1.3.1. Supported protocol

TCP/IPv4 is supported.

TCP/IP specifications

Layer	Protocol	Reception port	Application
Network layer	ARP, IP, ICMP		
	(ARP/Ping)		Temporary IP address setting
Transport layer	TCP, UDP		
Application layer	DHCP		Dynamic IP address setting
	LPD/LPR	515/TCP	Printing
	Raw Socket Print	9100/TCP	Retrieve print/printer status
	Check Alive	9101/TCP	Monitor printer status Update date/time log information
	SDP (Star Discovery Protocol)	22222/UDP	Search for printer on network
	TELNET	23/TCP	Network settings
	HTTP	80/TCP	Network settings Star CloudPRNT
	HTTPS	443/TCP	Star Micronics Cloud Services*1 Star CloudPRNT
	MQTT	1883/TCP	Star CloudPRNT
	MQTTS	8883/TCP	Star CloudPRNT
	AMQPS	5671/TCP	Star Micronics Cloud Services*1

*1 Communication with Star Micronics Cloud Services will start when power is turned ON, the status is changed, and a certain time duration has passed.

3.1.3.2. Setting item

Setting item	Input range	Initial value	Remarks
DHCP Timeout	ENABLE / DISABLE	ENABLE	
DNS 1	0.0.0.0 to 255.255.255.254	8.8.8.8	
DNS 2	0.0.0.0 to 255.255.255.254	8.8.4.4	
"root" Login Password	• 1 to 31 ASCII characters • ASCII character • Distinction between upper case and lower case characters	"public"	Always camouflaged with "*****".
Web Refresh Time (Sec.)	1 to 300	5	
9100 Multi Session	ENABLE / DISABLE	DISABLE	
9100 Data Timeout (Sec.)	0, 30, 40, 60, 120, 180, 360	0	
Disconnect Message	ENABLE / DISABLE	DISABLE	
TCP#9100	ENABLE / DISABLE	ENABLE	
TCP#9101	ENABLE / DISABLE	ENABLE	
LPR	ENABLE / DISABLE	ENABLE	
UDP#22222	ENABLE / DISABLE	ENABLE	
Telnet	ENABLE / DISABLE	DISABLE	
TCP#80	ENABLE / DISABLE	ENABLE	
TCP#22222	ENABLE / DISABLE	ENABLE	
Star CloudPRNT Cloud Service	ENABLE / DISABLE	DISABLE	
Star CloudPRNT Service URL	• 1 to 511 ASCII characters	Blank	
Star CloudPRNT Polling time (Sec.)	• 1 to 7200 seconds	5	
Star CloudPRNT UserName	• 1 to 63 ASCII characters	Blank	
Star CloudPRNT Password	• 1 to 63 ASCII characters	Blank	
Star CloudPRNT TLS trust level	Use trusted CA-Certificate list / Use custom CA-Certificate / Accept all	Use trusted CA-Certificate list	
Star CloudPRNT NTP Server	Use Star NTP service Use custom NTP server	Use Star NTP service	0.pool.ntp.org
Star CloudPRNT TLS1.2 Cipher Suites Encryption Level	HIGH + MEDIUM / MEDIUM	HIGH + MEDIUM	
Star CloudPRNT TLS1.3	ENABLE / DISABLE	ENABLE	
Star CloudPRNT HTTP Response Timeout (Sec.)	10, 20, 30, 40, 50, 60 s	60	

3.1.3.3. LPD/LPR

The LPR protocol that LPD of this product supports conform to RFC1179 (partially not supported) and logical printer names in the list are used as queue names. LPR stands for "Line PRinter daemon protocol". It is originally a protocol for printing provided as a UNIX printing system and currently supported standardly also by Windows (NT or later).

"LRP" may be used as an execution file name of the LPR print utility software.

The print server (Daemon) corresponding to LRP is called LPD (Line Printer Daemon).

LPD uses the TCP communication port 515.

- The reception buffer for printing data is 64 Kbytes (shared with Raw Socket Print).
- This does not support banner printing.
- Specify "lp" when specifying a queue name in the port setting on the host device side.
In addition, select "Enable" when addition of the LPR byte counter setting can be selected.

3.1.3.4. Raw Socket Print

This product supports Raw Socket Print communication for printing under a TCP/IP environment.

Raw Socket Print regards all data flowing between TCP sessions as the data handled between the printer and host device and performs bidirectional data distribution.

The TCP communication port specifications are as shown in the table below.

Item	Specifications	Remarks
Communication port number	TCP #9100	
Number of concurrent sessions	1 or 8	• The factory default setting is 1.
Data reception timeout	0 (disabled)/30 s/40 s/60 s/120 s/180 s/300 s	• The factory default setting is 0 (disabled). • Connection is shutdown forcibly At Timeout.

- The reception buffer for printing data is 64 Kbytes.
- The maximum number of reception sessions for port 9100 may be configured by HTTP (Web Configuration) or Star Configuration.

When "9100 Multi Session : Enable" is set, the maximum number of reception sessions is 8. When "9100 Multi Session : Disable" is set, the maximum number of reception sessions is 1. If the number of connections exceeds these values, a rejection packet (TCP Reset) is generated on the host device after it is connected.

- When multi-session is enabled and print data is received from multiple sessions (host devices) at the same time, the order in which the sessions are received and the order in which the print data is printed may not always match.
- The data in the direction from the printer to host device is status information obtained from the printer.

* For the details of status information, refer to the Commands Specifications.

- The TCP session disconnection (TCP FIN, RST) is considered to be the end of one document.

If special control, such as suspending a print job, is required, the host device performs processing.

If a RST packet is received when a TCP session is disconnected from the host device, part of the printing data may be deleted.

- Data reception data timeout "9100 Data Timeout" may be configured by Star Configuration and HTTP (Web Configuration).

This configuration automatically releases the sessions that remain connected.

3.1.3.5. Status acquisition function

This printer supports the printer status acquisition function through TCP communication port 9101.

The TCP communication port specifications are as shown in the table below.

Item	Specifications	Remarks
Communication port number	TCP #9101	
Number of concurrent sessions	4	
Data reception timeout	30 s	Connection is shutdown forcibly At Timeout.

When the following command and parameter are received from the host device, printer status information (ASB) is sent back.

When the command out of range is received, connection is shutdown.

Command	16 hex	Parameter
'2'	32 H	Optional 50 bytes (time information)

3.1.3.6. Discovery

This product has Star Micronics Co., Ltd. original NIC searching protocol SDP (Star Discovery Protocol).

SDP uses UDP communication port 22222.

SDP is used to search this product on the LAN through applications such as the setting utility.

Settings

3.1.3.7. IP address setting specifications

3.1.3.7.1. General description

The IP address of this printer is determined by the "fixed address (Static)" or "dynamic acquisition from the network with DHCP and ARP/Ping". The factory default settings are fixed address (Static) = unregistered and DHCP = enabled.

ARP/Ping is enabled when an address cannot be acquired for Static or DHCP.

The acquired IP address information can be confirmed in the self-printing display below.

```
*****
Current IP Parameters Status
*****
Current Network I/F : *I/F
IP Address          : xxx.xxx.xxx.xxx
                    (*Protocol)
Subnet Mask         : xxx.xxx.xxx.xxx
Default Gateway     : xxx.xxx.xxx.xxx
```

* *Protocol* : The following address acquisition protocols are displayed in the parentheses for the IP address field.

(Static) : Static (fixed address)

(DHCP) : Retrieved from DHCP server

(Ping ARP) : Retrieved using Ping ARP

(Didn't obtain): Could not retrieve IP address

3.1.3.7.2. Fixed address (Static)

If the static IP address, subnet mask, and default gateway are registered, the printer always starts in a fixed condition when the power is turned on. DHCP and ARP/Ping are disabled.

Because fixed address is not registered at the time of shipment from the factory, register the fixed address using HTTP (Web Configuration) or Star Configuration after acquiring a dynamic address using DHCP or ARP/Ping.

(→ See "3.1.3.10 Web Configuration")

3.1.3.7.3. DHCP

If the DHCP (Dynamic Host Configuration Protocol) is enabled, the IP address, subnet mask, and default gateway are acquired from the network.

Check whether the DHCP server is installed in the LAN.

When shipped from the factory, DHCP is enabled. If returning the setting from a fixed address to DHCP, make a change by initializing the network settings or with HTTP (Web Configuration) or Star Configuration.

(→ See "3.1.3.10 Web Configuration")

- DHCP Request varies depending on the DHCP Timeout setting. (→ See "4.2.7 Special function setting mode (when the power is turned on)")
 - DHCP Timeout = ON: DHCP Request is generated three times within 20 seconds of TCP/IP start-up.
 - DHCP Timeout = OFF: Requests are generated continuously until address information is acquired.
- Address acquired from DHCP disappears when the power is turned OFF.

3.1.3.7.4. ARP/Ping

A temporary IP address by ARP/Ping can be set by registering a combination of the IP address and MAC address of the printer to the ARP (Address Resolution Protocol) table on the host device and transmitting a ping.

The temporary IP address set by the ARP/Ping is possible to receive when the fixed IP address is not specified and the IP address is not acquired from DHCP. The address can be acquired by ARP/Ping only once.

- Subnet mask and default gateway cannot be specified for ARP/Ping.
- Address acquired by ARP/Ping disappears when the power is turned OFF.

For execution examples, see "11.1 Example of ARP/Ping execution".

3.1.3.8. Web Configuration

This product is equipped with an HTTP (Hyper Text Transfer Protocol) server which allows you to change network settings, display network information, monitor the printer status, etc. by accessing a Web browser. The HTTP server uses the TCP-UDP communication port 80.

- The HTTP version is of the HTTP 1.1 specifications.
- Up to two devices can be connected at the same time.

If three or more devices need to access the site, please try connecting (reload) 5 seconds after the previous two devices completes read.

- Enable "JavaScript" in the web browser settings.
- User website [login not required]: `http://IP Address/index.htm`
Example) `http://192.168.10.1/index.htm`
- Administrator website [login required]: `http://IP Address/html/main.htm`
Example) `http://192.168.10.1/html/main.htm`

- Check and change of network settings and password settings [login required]

By specifying set print execution when settings are written, it is possible to confirm if contents have been written correctly to nonvolatile memory. In addition, if writing is successful, the printer will automatically reset.

- Displaying network information [login not required]
- Displaying printer information [login not required]

The printer status display is updated automatically at the set refresh time.

Accounts (user names and passwords) accessible from the web browser are as shown in the table below.

Items that can be checked and set differ depending on the account.

Account	User name	Password	Target
User	Login not required		General user (Information display only)
Route user	"root"	"public" • 1 to 31 ASCII characters (can be changed)	System administrator (Information display & write)

The following web browser versions have been checked and are supported.

- Windows11 24H2: Chrome 134, Microsoft Edge 134
- macOS 15.3.1 Monterey / 13 Ventura: Safari
- iOS 16.1: Safari
- Android 15: Chrome
- Linux Ubuntu 24.04: Firefox 134.0

3.1.3.9. TELNET server

3.1.3.9.1. Specifications

The TELNET (TELecommunication NETWork) of this product allows you to change network settings such as IP parameters or passwords in an interactive menu format, or display network information or the printer status.

The User name of each login account, password, and access privileges are as shown in the following chart.

Account	User name (fixed)	Password	Target
User	"user"	"guest" (fixed)	General user (Read privilege)
Root	"root"	"public" (factory default) • ASCII characters between 1 to 31 characters	System administrator (Read and write)

- By specifying set print execution when settings are written, it is possible to confirm if contents have been written correctly to nonvolatile memory. In addition, if writing is successful, the printer will automatically reset.
- Can be executed by inputting commands in an interactive menu format from the host device using dedicated software (Windows) or terminal software.

3.1.3.9.2. IP address setting

The input range for a fixed address and DHCP is shown in the following table.

Category	Setting item	Input range	Initial value (Factory setting)
Fixed address (Static)	IP Address	0.0.0.0 to 255.255.255.255	0.0.0.0
	Subnet Mask	0.0.0.0 to 255.255.255.255	0.0.0.0
	Default Gateway	0.0.0.0 to 255.255.255.255	0.0.0.0
Dynamic address	DHCP	ENABLE / DISABLE	ENABLE

<Note> If you set a fixed address, it will automatically be "DHCP: DISABLE".

When set to "DHCP: ENABLE" all the fixed address fields will automatically become 0.0.0.0.

3.1.3.9.3. Password setting

The password input range are as shown in the table below.

Setting item	Input range	Initial value (Factory setting)
"root" Login Password	• 1 to 31 ASCII characters • ASCII characters (upper case/lower case sensitive)	"public"

3.1.3.9.4. Raw Socket Print setting

The input range of the maximum number of connection sessions of Raw Socket Print is as shown in the table below.

Setting item	Input range	Initial value (Factory setting)
9100 Multi Session	ENABLE / DISABLE	DISABLE

3.1.3.9.5. Disconnect warning print setting

The input range is as shown in the table below.

Setting item	Input range	Initial value (Factory setting)
Disconnect Message	ENABLE / DISABLE	DISABLE

3.1.3.9.6. Status display, etc.

Status display is possible for the following items.

(1) Firmware version display

Displays the version number of the main program and boot program.

(2) Current IP parameters / status display

Displays IP parameters in operation.

The protocol used to retrieve the address is displayed inside the parenthesis of the IP address.

(3) Printer device ID display

Displays the device ID of the printer. Format conforms to IEEE1284.

(4) Printer status display

Displays the printer status in hexadecimal dump format.

3.1.3.10. Broken link warning print

If any of the following network errors is detected, the printer will automatically print a warning.

(1) Link down [Physically disconnected]

* See "4.4 LED indicator and errors"

A warning is printed when a link-down state [physically disconnected] has continued for 4 seconds.

(2) Link down [IP address not obtained]

* See "4.4 LED indicator and errors"

A warning is printed when a link-down state [IP address not obtained] has been detected.

However if DHCP is enabled, when the IP address is waiting acquisition (state is not a time-out), warning printing is not performed.

This function can be enabled/disabled by TELNET and HTTP (Web Configuration).

It is disabled in the factory setting. (→ See "3.1.3.11.TELNET server" and "3.1.3.10. Web Configuration")

In addition, the setting status can be confirmed by self-printing.

Print sample



3.1.3.11. SSL/TLS communication

3.1.3.11.1. General description

This printer can encrypt HTTPS and AMQPS communication using SSL (Socket Security Layer) or TLS (Transport Layer Security).

3.1.3.11.2. Specifications for during client operation

The services in which the printer operates as a SSL/TLS client are the following.

- Star CloudPRNT
- Star Micronics Cloud Services

3.1.3.11.2.1. Specifications

<Communication specifications>

SSL/TLS version	: TLS1.2, TLS1.3
Application protocol	: HTTPS, AMQPS(*1)
TCP communication port number	: 443
Certificate	: Preinstalled CA certificate or custom CA certificate
Encryption algorithm	: AES 128/256 (GCM, CBC), ChaCha20 (Poly1305)
Hash algorithm	: SHA-384, SHA-256, SHA-1

(*1) See "11.2.1 Star CloudPRNT" for the supported cipher suite.

Convenient functions

3.1.4. Star Micronics Cloud Services

<General description>

If you connect the printer to Star Micronics Cloud Services, helpful cloud services for operating your store are available for free.

<Services for stores>

Device Monitor : You can check the printer status and the number of receipts in the graph.

Digital Journal : You can check the digitized receipt data in the cloud at any time.

PromoPRNT : You can configure the setting for issuing paper coupons and manage the schedule in the cloud.

Label Builder : You can freely create, print, and register the label data.

<Services for developers>

Device Manager API : Printer status and receipt printing data can be acquired by webAPI.
In addition, the printer settings can be remotely configured using webAPI.

Star Quick Setup Utility Customizer : The Star Quick Setup Utility display items can be customized.

Star Document Markup Designer : The print data by Star Document Markup can be created by using GUI.

A wide range of other services will also be made available. For details, please access the following website.

Star Micronics Cloud Services (www.starmicronicscloud.com)

3.1.5. Star CloudPRNT function

3.1.5.1. General description

Star CloudPRNT is a protocol that enables printing to a printer and controlling of peripheral devices from a back-end service on a remote server. Two types of communication protocols are available: Version HTTP and Version MQTT.

For details about the server-side specifications, see "[Star CloudPRNT Protocol Guide](#)".

<CloudPRNT communication protocol Version HTTP>

This enables to perform print control (printing, etc.) by polling via a network between a remote server(*) and this product.

This product performs polling to the remote server for the printer information (status, printer identifier, etc.) and the remote server notifies this product of that the data has been prepared on the remote server in the response to the polling. At that time, this product acquires the printing data from the remote server and can print the data.

<CloudPRNT communication protocol Version MQTT>

By utilizing the MQTT protocol in addition to the HTTP protocol for communication between an arbitrary remote server(*) and the device, communication delay can be reduced, and this enables faster printing control.

Version MQTT provides the following two methods:

- Trigger POST
- Full MQTT/Pass URL

* In the communication with the product, implementation based on the Star CloudPRNT specifications is required on the remote server.

3.1.5.2. Specifications

<Communication specifications>

TCP version : TCP/IP v4

Communication protocol : HTTP/HTTPS (Version HTTP), HTTP/HTTPS/MQTT/MQTTS (Version MQTT)

Communication data format : Compatible with REST/JSON format

Communication session start : Started from this product side.

With Version MQTT, upon printer startup, a server setting information retrieval request (GET) is issued, and the protocol to be used is determined based on the GET response.

[When not printing(*)]

- Version HTTP/Trigger POST

Printer information is sent to the server by POST request.

- Full MQTT/Pass URL

Printer information is sent to the server by POST request.

[When printing]

- Version HTTP/Trigger POST/Pass URL

Print data is acquired from the server by GET request.

- Full MQTT

Print data is acquired from the server by MQTT Subscribe.

Communication session end : Ended from the server side.

[When not printing(*)]

When there is data on the server, print job notification, non-printing control commands, and other information are sent to the printer.

[When printing]

The printing data on the server is sent to the printer.

* Control other than status notification and printing

Additionally, with Version HTTP, this communication session is continuously polled at an arbitrary polling cycle.

<Remarks>

The CloudPRNT protocol uses the MAC address of the wired LAN port of the printer even when the printer is connected via wireless LAN.

This allows the server to recognize and manage the printer as the same device, regardless of whether the printer uses wired LAN or wireless LAN.

<Request/response specifications between server and printer>

For details on the process flow between server and printer, HTTP request/response specifications, and MQTT topic/message specifications, refer to the Protocol Guide.

- Version HTTP process flow

https://star-m.jp/products/s_print/sdk/StarCloudPRNT/manual/ja/protocol-guide.html#uklink02

- Trigger POST process flow

https://star-m.jp/products/s_print/sdk/StarCloudPRNT/manual/ja/protocol-guide.html#uklink04

- Full MQTT/Pass URL process flow

https://star-m.jp/products/s_print/sdk/StarCloudPRNT/manual/ja/protocol-guide.html#uklink05

- Version HTTP request/response specifications

https://star-m.jp/products/s_print/sdk/StarCloudPRNT/manual/ja/protocol-reference/http-method-reference/index.html

- Version MQTT topic/message specifications

https://star-m.jp/products/s_print/sdk/StarCloudPRNT/manual/ja/protocol-reference/mqtt-method-reference/index.html

<Web Configuration UI setting specifications>

The screenshot displays the Web Configuration UI. On the left is a sidebar menu with categories: Home, Network Configuration, Display Status, System Access, and Manual. The 'CloudPRNT' option under Network Configuration is highlighted with a red circle. The main content area is divided into two sections: 'CloudPRNT' and 'TLS Client Settings'. The 'CloudPRNT' section includes fields for 'CloudPRNT Service' (set to DISABLE), 'Server URL', 'Polling time (Sec.)' (set to 5), 'HTTP Response Timeout (Sec.)' (set to 60), 'User Name', and 'Password'. The 'TLS Client Settings' section includes 'TLS trust level' (radio buttons for 'Use trusted CA-Certificate list', 'Use custom CA-Certificate set', and 'Accept all (Warning - not secure!)'), 'NTP Server' (radio buttons for 'Use Star NTP service' and 'Use custom NTP server'), 'TLS1.2 Cipher Suites Encryption Level' (set to HIGH + MEDIUM), and 'TLS1.3' (set to ENABLE). Both sections have 'submit' and 'cancel' buttons at the bottom.

- Items set from the CloudPRNT menu of the product Web Configuration UI
 - CloudPRNT Service : Enable or disable settings for services Factory default setting = Disabled
 - Server URL : Enter the server URL as "http://..." etc.
With Version MQTT, a server setting information retrieval request (GET) is executed based on this URL to determine the operating protocol.
 - Polling time : Enter the polling time (seconds). Factory default setting = 5 sec
If the printer runs on CloudPRNT Version MQTT, this setting is not used.
 - HTTP Response Timeout: The timeout time (in seconds) when there is no response from the server during polling or print data retrieval. One of the following values can be selected: "10, 20, 30, 40, 50, 60". Factory default setting = 60 sec
 - User Name/Password : As needed, register cloud server security information. (option)
 - TLS trust level : Set the certificate (PEM format) according to the server-side specifications when conducting secure communication with the server.
When "Use custom CA-certificate set" is selected, the "trusted CA-certificate list"

is also used for server authentication.

- NTP Server : Sets the NTP server used for time information inquiries. The StarNTP service (0.pool.ntp.org) is selected as the factory default setting. As necessary, enter the URL of the user's own NTP server.
- TLS1.2 Cipher Suites Encryption Level :
Sets the encryption level of TLS1.2 encryption suite (this model uses only the default setting value). For details, see "11.2.1 Star CloudPRNT". Factory default setting = HIGH + MEDIUM.
- TLS1.3 : Sets whether TLS1.3 is enabled or disabled. See "11.2.1 Star CloudPRNT" for the encryption suites corresponding to enabled TLS1.3. Factory default setting = Enabled.

Refer to "the separate Developer Guide" for details of the server-side specifications.

3.2. USB interface

3.2.1. USB-C port

- (1) Communication standard : USB2.0 Full-speed Device Host
- (2) Power supply : USB PD (maximum 20 W), USB-C Current (maximum 15 W),
USB BC1.2 CDP (maximum 7.5 W), iAP2 (maximum 15 W)
- (3) Device classes : Printer classes, CDC-ECM, RNDIS
- (4) Protocol : AOA / iAP2 / SteadyLAN
- (5) Connector : USB-C

To connect a device, use the cable that matches the terminal to be used.

For details of the cable, see "Operation availability according to combination" in "3.2.1.4 USB-C function setting".

In addition, be sure to fully verify operation with the actual device before beginning actual use.

3.2.1.1. Using an iOS device

With an iOS device, it is possible to perform charging of the device while communicating.

When USB communication is not required and when using only to charge the device, set the USB-C function to power supply only mode.

For details, see "3.2.1.4 USB-C function setting".

3.2.1.2. Using an Android device

With an Android device, regardless of PD compatibility, it is possible to perform charging of the device while communicating.

Android OS version 9 and later are supported.

When connecting an Android device to the USB-C port for the purpose of communication, start the Android device first, connect the device to the printer using the USB cable, and then turn ON the printer power.

If communication or power supply does not operate, operation may become possible if you disconnect and reconnect the cable.

3.2.1.3. Using a Windows/macOS device

- Using a device equipped only with USB-A port

Prepare the USB cable (C-A). Communication with the device is possible.

- Using a device equipped only with USB-C port

Prepare the USB cable (C-C).

If the USB-C port supports charging by USB PD, it is possible to perform charging of the device while communicating.

If communication is not possible, communication with the device can be made possible by changing the USB-C function setting to "Data only".

For details, see "3.2.1.4 USB-C function setting".

3.2.1.4. USB-C function setting

The USB-C port of this product automatically recognizes the connected device and enables communication. If this product does not operate as expected, the operation of the USB-C port can be switched using the USB-C function settings.

Operation details are as shown in the following table.

Details of USB-C function setting

USB-C function setting	Description
Power supply + communication (default)	This setting performs both power supply to the device and communication with the device. With this setting, power supply and communication with the following devices are possible. • iPad • iPhone • Android • Windows/macOS (USB-C port that supports charging by USB PD) With this setting, communication with the following devices is possible. • Windows/macOS (USB-A port)
Communication only	This setting performs communication with some devices. Power supply to the device is not possible. Use this setting when communication with a higher-level device is not possible with the power supply + communication setting. With this setting, communication with the following devices is possible. • Windows (USB-C port that does not support charging by USB PD)
Power supply only	This setting performs only power supply to the device. Communication with the device is not possible. When USB communication is not required, and when using only for charging, apply this setting.

To change settings, use Star Configuration, Star Quick Setup Utility, or USB-C function switching mode.

Whether or not power supply to the device is possible and whether or not communication with the device is possible according to the combination of device information, cable used, and printer USB-C function setting (power supply + communication mode, communication only mode) are as shown below.

Be sure to fully verify operation with the actual device before beginning actual use.

Operation availability according to combination

Device information		Cable	Printer information		Operation	
Type	Connector		Connector	USB-C function setting	Power supply	Communication
iPad iPhone	USB-C	USB-C –USB-C *1	USB-C	Power supply + communication (default)	✓	✓
	Lightning	Lightning – USB-C *2		Communication only	-	-
				Power supply + communication (default)	✓	✓
				Communication only	-	-
Android	USB-C	USB-C –USB-C *1		Power supply + communication (default)	✓	✓
	USB Micro-B	USB Micro-B - USB-C *3		Communication only	-	✓
				Power supply + communication (default)	✓	✓
				Communication only	-	-
Windows /macOS	USB-A	USB-A - USB-C *3		Power supply + communication (default)	-	✓
	USB-C Charging (USB PD) supported	USB-C –USB-C *1		Communication only	-	✓
				Power supply + communication (default)	✓	✓
				Communication only	-	✓
				USB-C Charging (USB PD) not supported	USB-C –USB-C *1	Power supply + communication (default)
				Communication only	-	✓

*1) Cable supporting 3.0 A or higher with a maximum length of 2 m and conforming to USB2.0 standard

*2) Apple genuine cable or MFi certified cable with a maximum length of 2 m

*3) Cable with a maximum length of 2 m and conforming to USB2.0 standard

3.2.2. USB-A port

- (1) Communication standard : USB2.0 Full-speed Embedded Host
- (2) Power supply : USB BC1.2 SDP (maximum 2.5 W)
- (3) Connector : USB-A

When one of the following devices was connected, communication is performed as the USB host and max. 5 V/0.5 A is supplied.

- Customer display (SCD222U)
- Barcode scanner (BCR-POP1)
- HID device (keyboard interface)
- USB memory device

Communication is not possible with USB devices other than above, but max. 5 V/0.5 A is supplied.

<Note> If communication with connected devices is impossible, it will be indicated by the LED.
See "4.4 LED indicator and errors".

3.2.3. Commercially available devices that can be used

The followings are commercially available USB devices that has been tested and can be connected to the USB-A port.

- Barcode scanner

- HID device

Target: HID device with USB keyboard interface

<Notes>

- 1) Cannot be used simultaneously with the barcode scanner.
- 2) The operation of all commercially available HID devices is not guaranteed. Be sure to fully verify operation with the actual device before beginning actual use.

- USB memory device

<Connectable USB flash drive specifications>

File system : FAT12/16/32

Device class : Mass Storage

Devices subclass: SCSI transparent command set

Device protocol : Bulk-Only Transport

<Application>

Execute printer firmware rewrite by saving the Star Configuration described in the JSON file and printer firmware data in the USB flash drive.

<Notes>

- 1) Even when the USB memory device satisfies the above specifications, it may not be possible to use the device when an extension cable is used, or for other reasons such as compatibility with the printer USB host. If this occurs, use a different USB flash drive.
- 2) For details about the Star Configuration Format and the firmware rewrite procedure, refer to the download site in "7. Firmware Update".

- USB serial conversion cable

Target: USB serial conversion cable equipped with FTDI chip (VID/PID = 0x0403/0x6015) or Prolific chip (VID/PID = 0x067B/0x23C3 or VID/PID = 0x067B/0x23A3)

<Notes>

1) The operation of all commercially available USB serial conversion cable is not guaranteed.

Be sure to fully verify operation with the actual device before beginning actual use.

A list of USB serial conversion cables tested for operation is shown below.

Model name	Manufacturer	Chip manufacturer	VID/PID
UGREEN USB2.0 TO DB9 RS-232 MALE SERIAL CABLE(SKU:20210)	UGREEN	Prolific	0x067B/0x23C3
USB / serial cable - USB to DB-9(SKU: 1TACCCAB-071693)	NEWlink	Prolific	0x067B/0x23A3

2) For several milliseconds immediately after turning the power on, the TXD output level is unstable. For that reason, the host may receive noise data. Therefore, the host must handle the transmission data during power-on as error data.

<Communication specifications>

For details of settings below, see "9 Star Configuration Format".

Baud rates : 4800, 9600, 19200, 38400, 57600, 115200 bps
Data length : 7 bits, 8 bits
Parity : None, even, odd
Stop bit : 1 bit (fixed)
Handshaking : DTR mode, Xon/Xoff mode
BUSY condition : Receive buffer full or offline, receive buffer full
ASB function : Disabled, enabled

3.3. Bluetooth interface (wireless model only)

3.3.1. Wireless communication unit

Bluetooth Classic specifications	: Bluetooth V5.0 (BR/EDR-supported), class 2
Frequency bandwidth	: 2,402 MHz to 2,480 MHz
Frequency interval	: 2 MHz (ch. 0 to ch. 39)
Supported profile	: SPP
Security	: SSP
iOS accessory protocol	: iAP2
Communicable distance (*2)	: 5 m
Interference distance	: 10 to 20 m

(*1) If the Bluetooth module of the device being used is V2.0 or earlier, a PIN Code is required to connect via Bluetooth to this unit. The PIN Code is "1234".

(*2) This is the distance that has been tested for operation.

However, there should be no obstacles between the host device and printer and their surrounding areas that interfere with communication.

In addition, since the communication distance varies depending on the surrounding reception environment, obstacles, installation environment, etc., an evaluation should be thoroughly performed at the time of setup.

Bluetooth Low Energy specifications	: Bluetooth V5.3
Carrier frequency bandwidth	: 2,402 MHz to 2,480 MHz
Frequency interval	: 2 MHz (ch. 0 to ch. 39)
Supported profile	: GATT (unique format)
Communicable distance	: 50 cm

<Notes>

- 1) Bluetooth Low Energy can be used only for printer settings but not for printing.
- 2) Bluetooth Low Energy becomes communicable only with the special application [Star Quick Setup Utility]. For details on how to obtain it, see "8.2 Software".

3.3.2. Bluetooth connection

You can scan the QR code for Bluetooth connection with Star Quick Setup Utility to pair the printer with a device.

The QR code for connection is printed under one of the following two conditions:

- 1) Executing self-printing (not printed if Bluetooth Classic is disabled)
- 2) Automatic printing when all of the following apply 20 seconds after startup:

- Bluetooth Classic is not disabled.
- The printer is running in access point mode.
- No LAN cable is connected.
- No device is connected to the USB-A port or USB-C port.
- There is no Bluetooth pairing history.
- Self-printing is not executed.

3.3.3. Bluetooth settings

Setting item	Initial value
Bluetooth Classic	Enabled
Device name (*1)	mC-Label2-"5-digit identification number unique to each product"
iOS port name	mC-Label2
New pairing permission	Enabled
Auto Connection	Valid (iOS auto detection)
Bluetooth LE	Enabled

The above settings can be checked from the self-printing results and can be changed by using the Star Quick Setup Utility.

(*1) Device name

Holds a Bluetooth device ID consisting of maximum 16 digits as a unique identification code specifically (mC-Label2-"5-digit identification number unique to each product") on the inside of the printer.

3.3.4. Confirm Bluetooth settings

The Bluetooth settings can be checked by self-printing.

For details, see "4.2.3 Self-printing mode".

Self-printing sample

*** Bluetooth Information ***

Bluetooth Classic : DISABLE *1

Dev Name : mC-Label2-I0044

iOS Name : mC-Label2

Address : 00-11-62-00-06-41

Auto Connection : ON

New Pairing Permission : ON

Scan the QR

to Pair by Star Quick Setup Utility



Bluetooth LE : DISABLE *2

*** Bluetooth Information END ***

You can scan the QR code with Star Quick Setup Utility to pair the printer with a device or select the printer to connect to.

(*1) Printed only when Bluetooth Classic is disabled.

(*2) Printed only when Bluetooth LE is disabled.

3.3.5. Function to prevent unauthorized Bluetooth connections

This unit, as a function to prevent unauthorized access from a tablet or PC that is not connected, has a function to prohibit Bluetooth connections from devices other than those where a Bluetooth connection has already been established. For security purposes, after a Bluetooth connection has been established for the devices to be used, it is recommended that you open Star Quick Setup Utility and disable the setting for "New Pairing Permission".

The factory default setting is set to "Enabled".

If the "New Pairing Permission" setting is "Enabled" : No limit with the Bluetooth connection

If the "New Pairing Permission" setting is "Disabled" : No new Bluetooth connection is allowed

"New Pairing Permission" : Notes when "Disabled" is chosen

When the following cases occur when "New Pairing Permission : Disabled" is set, initialization of Bluetooth must be performed. After initialization is carried out for the printer, and Bluetooth connection performed, it is recommended that you disable "New Pairing Permission" again for enhanced security.

- If changing the tablet or PC with the Bluetooth connection because of loss or malfunction
- If a Bluetooth connection information to this unit is deleted from the Bluetooth settings of the tablet or PC

See "4.3.1 Initializing communication settings" for the initialization procedure.

3.3.6. Auto Connection Function (iOS only)

This unit is installed with the Auto Connection Function because it is always used in a one-to-one connection with an iPad or other iOS devices. When the Auto Connection Function is used, because this unit connects automatically to the iOS device that was most recently connected to when it reconnects after a connection was interrupted, it is not necessary to perform manual connection again.

If the device you connected to last time is not iOS, the behavior is the same as that of Auto Connection OFF.

	Auto Connection : ON (Default)	Auto Connection : OFF
Reconnection with upper level terminal (device)	1) After the power is turned ON for the printer, it attempts to automatically connect to the most recently connected iOS device. 2) If step 1) fails, wait for a connection from another device. 3) If not connected in step 2), return to step 1).	Wait for the connection from the upper level terminal (device) after the printer is turned ON. Select the device name of the printer from the Bluetooth settings screen of the upper level terminal (device).
Changes to the upper level terminal (device)	Turn the Bluetooth function of the upper level terminal (device) which has the automatic connection destination set to OFF and select the device name of the printer that needs change in the Bluetooth settings on the screen of the upper level terminal (device).	After the power is turned ON for this unit, select the device name of the printer from the Bluetooth settings screen of the upper level terminal (device).
Application example	The printer is used on a one-to-one basis with the upper level terminal (device).	The printer is used with multiple upper level terminals (devices).

Auto Connection ON and OFF can be switched through either the printer operation or Star Configuration and Star Quick Setup Utility.

3.3.7. Notes on Bluetooth interface

Waiting time until the start of the communication : Recommended 100 msec or longer

After connection to the upper level terminal (device), as post-processing was performed in the Bluetooth module, it is recommended that a waiting time of 100 msec or more should be applied between port open and the start of sending data for the application.

Note that the above value changes according to the developmental environment of the application and operating environment (upper level terminal (device) type and usage environment), therefore it is necessary to conduct sufficient operational tests in advance, and determine a waiting time.

Waiting time until reconnection : Recommended 500 msec or longer

After disconnection from the upper level terminal (port close), post-processing is performed in the Bluetooth module. Therefore, it is recommended that a waiting time of 500 msec or longer be applied before reconnection starts (before the next time the port opens after it is closed) for the application. Note that the above value changes according to the developmental environment of the application and operating environment (upper level terminal (device) type and usage environment), therefore it is necessary to conduct sufficient operational tests in advance, and determine a waiting time.

Disconnection timing

Even if data transfer from the application of upper level terminal (device) is already completed, data may remain in the printer internal buffer. When the port is closed, the data left in the buffer may be discarded. When printing or disconnecting wireless connection, check the status and ensure that the transmitted data has been printed.

Consider retries on upper level terminal

We recommend a retry implementation on the upper level terminal, considering the risk of connection failure due to wireless communications. Perform appropriate operation tests in advance because the waiting time depends on the execution environment (the type of upper level terminal (device) and the usage environment).

Notes when using the Bluetooth USB Adapter

Always check the applicable specifications and verify the printer operation carefully.

Notes if you have made changes in Bluetooth settings, or had it reset

To reflect the changed contents to the upper level terminal (device), delete the Bluetooth connection information for the upper level terminal (device) and restart the associated application or system. After restarting, connect via Bluetooth again.

3.4. Printing with multiple interfaces

This printer supports printing using multiple interfaces, and the interfaces can be dynamically switched during use without turning the printer power off/on or disconnecting and reconnecting the interface cable.

There is one receiving buffer for commands and printing data, and the interface of the data which was received first occupies the receiving buffer. If the receiving buffer continues to be empty for more than a certain period, it becomes possible to release receiving buffer and switch between interfaces. You can change the interface switching wait time by using Star Configuration or the Star Quick Setup Utility.

For details, see "9 Star Configuration Format" or Star Quick Setup Utility.

<Restrictions>

1) Simultaneous connection of wired LAN and wireless LAN

The printer cannot be connected via both wired LAN and wireless LAN simultaneously. When the printer is connected via wired LAN, wireless LAN is disabled.

2) Simultaneous use of USB-C and Bluetooth on iOS

When an iOS device is connected to the printer via USB-C while a Bluetooth connection is active, Bluetooth will be disconnected and the device will be automatically connected via USB-C. Afterward, when the USB-C connection is disconnected, the Auto Connection Function will automatically establish the Bluetooth connection, and the connection will switch to Bluetooth.

3) Phenomenon of print data loss or disconnection during Bluetooth communication on iOS

If any of the following conditions apply during Bluetooth communication with an iOS device, a phenomenon may occur, for example, print data may be erased or the communication may be disconnected.

- When another interface occupies the receiving buffer, the iOS device sends 8 KB or more data via Bluetooth.
- When the printer is offline (unable to print due to a no paper error), the iOS device sends 72 KB or more data via Bluetooth.

To avoid the above phenomenon, make sure that the printer is online (able to print without an error), and then send the print data.

<Handling method in Star Micronics software>

When using the StarPRNT SDK, please confirm that the printer is online before sending print data and use beginCheckedBlock/endCheckedBlock to verify print completion.

In Star Micronics software, this handling is only necessary for the StarPRNT SDK.

If communication is disconnected when the Auto Connection Function of the printer is set to ON, turn the printer OFF once, and then turn it ON again to restore the Bluetooth connection.

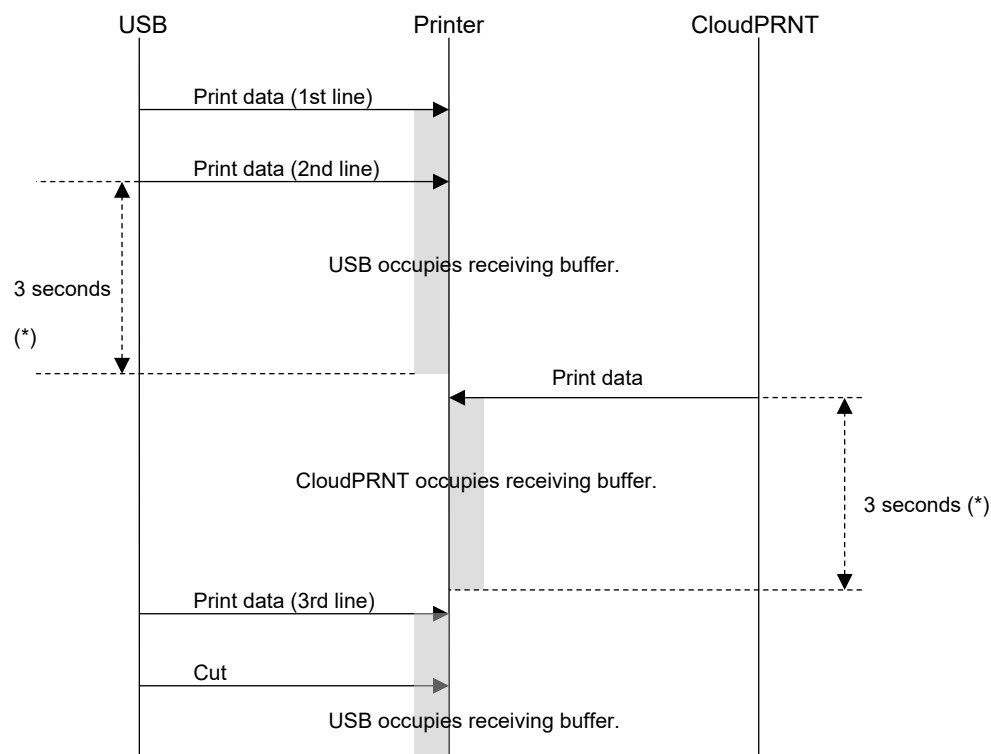
When the Auto Connection Function is set to OFF, perform Bluetooth pairing again.

4) Print data mixing

When using multiple interfaces in parallel and the data transmission interval is equal to or longer than the interface switching wait time, then data may become mixed.

For example, when sharing a single printer with USB and CloudPRNT, and as shown in the figure below the transmission interval for USB print data (2nd line) and print data (3rd line) is 3 seconds(*) or more, then mixing of the CloudPRNT print data occurs.

Example) Cases when data mixing occurs with USB and CloudPRNT



* When the interface switching wait time is default (3 seconds)

Data mixing can be prevented by paying attention to the following.

When sending print data from the application to the printer, send one entire document all at once without a transmission interval within the document.

When the transmission interval within a document is 3 seconds or more, set a longer interface switching wait time.

3.5. SteadyLAN

SteadyLAN overview

By using a USB cable to connect a Windows, Android (device supporting USB PD only), or iOS device to the USB-C connector of a printer that is connected to a wired LAN network, it is possible for the terminal (device) to use the Internet without requiring Wi-Fi communication.

At the same time, the device can communicate with the printer via USB communication or wired LAN communication, and is also charged from the printer.

This simplifies the wiring. In addition, because all parts of the solution are wired, more stable network connections are possible.

- You can switch between enabled and disabled through a command and Star Quick Setup Utility.
The default is disabled.
- The terminal Ethernet MAC address is assigned by the printer when the USB-C cable is connected.
The assigned MAC address can be checked by the self-printing mode of the printer.
For details, see "4.2.3 Self-printing mode".
- iOS 10.1.1 and later, Android 9 and later, and Windows 10 and later are supported.
- To use this feature on Windows, it is necessary to install the printer driver.

This printer supports the following operating modes.

Operating mode	iOS	Android	Windows
SteadyLAN for iOS	☐	☐	☐
SteadyLAN for Android	☐	☐	☐
SteadyLAN for Windows	☐	☐	☐
SteadyLAN for all OS	☐	☐	☐

The printer automatically determines the OS of the connected terminal, supporting iOS, Android, and Windows in all operation modes.

SteadyLAN for iOS/for Android/for Windows is a setting to maintain compatibility with the first generation of mC-Print3.

List of devices where operation was tested

Product Model	OS version
iPhone 13	iOS 18.3.1
iPad Air (4th generation)	iOS 14.8
Google Pixel 8	Android15
SAMSUNG Galaxy Tab A with S Pen	Android10
Huawei MediaPad M3 Lite	Android7

[Precautions]

- When using the SteadyLAN function, the communication speed is approximately 1 Mbps and it may be slower than the wireless LAN.
- It is recommended that the terminal Wi-Fi setting be turned OFF.
- After the SteadyLAN setting is changed, and a Windows terminal is connected to USB, a new printer queue is created and the printer queue is changed. At this time, delete the original printer queue.
- Depending on the type of device, when using the SteadyLAN function in a closed network environment (environment not connected to the Internet), if the device power was turned OFF and then ON while the device was connected to the printer, network communication will become no longer possible or the device will stop functioning with some device models.

If this occurs, try disconnecting and reconnecting the USB cable that connects the printer and device.

4. Operating Portion and Function

4.1. Power button

Press the Power button to turn on the power. Release the Power button when Power LED lights up.

To turn off the power, press and hold the Power button for 1 second or longer.

Selection of function disable settings is possible by using Star Configuration.

(Press and hold for 5 seconds or longer to force hardware reset.)

4.2. Multi-function button

The multi-function button enables functions such as One Touch Label and paper feed.

To switch or set the function related to this button, use Star Quick Setup Utility or Star Configuration.

The default setting is the paper feed function.

Details of functions are as described below.

4.2.1. One Touch Label

One Touch Label is a function that allows you to print a logo image registered on the printer by simply pressing the multi-function button.

Please use this function in order to print the necessary number of the same label when needed.

This function can print three types of logo images, which can be selected according to the number of times the multi-function button is pressed.

- | | |
|----------------------------|---|
| Press once | : Prints the logo image 1 |
| Press twice in a row | : Prints the logo image 2 |
| Press three times in a row | : Prints the logo image 3 |
| Long press | : Prints all of the logo images 1 through 3 |

To use this function, configure the following setting with Star Quick Setup Utility or Star Configuration.

- Change the function settings of the multi-function button to One Touch Label.
- Assign the logo image to the multi-function button.

Additionally, the logo images to print can be registered by using Star Quick Setup Utility.

For details, refer to Star Quick Setup Utility or see "9 Star Configuration Format".

4.2.2. Paper feed

Pressing the button in online status feeds and cuts paper.

Cuts at the BM position when the BM detection is enabled. Cuts at the GAP position when the GAP detection is enabled.

In other situations, feeds paper the specified length and cuts it.

4.2.3. Self-printing mode

The self-printing mode prints information, such as firmware version, model name, Star Configuration settings, and network settings.

Only the Star Configuration settings which have been changed from the factory default settings are printed.

In the case of settings that use die cut labels, self-printing can also be performed using receipt paper. By using receipt paper, it is possible to check self-printing without missing any printed content.

<How to enter self-printing mode>

When the power is turned on while the multi-function button is pressed, it will go into the self-printing mode.

After self-printing is completed, the printer automatically returns to normal mode.

4.2.4. Hexadecimal dump mode

4.2.4.1. Hexadecimal dump print mode

Open the printer cover, and then turn on the power while pressing the multi-function button.

Release the button after the Power LED flashes blue. (Note: Release the button while the Power LED is flashing blue.)

If the Power LED turns blue while the button is pressed down, turn OFF the power and start over. When the printer cover is closed, the "Hex Dump Mode" title will be printed, and it will enter the hexadecimal dump print mode.

Data subsequently received will be printed in hexadecimal.

To finish the hexadecimal dump printing function, turn OFF the power to the printer.

4.2.5. Special function setting mode (when the power is turned on)

* Procedure for special function settings: A → B → C

A: Entering special mode

Cover open + Press the multi-function button + Turn on the power

- The blue LED flashes for 5 sec (every 0.25 sec)
- The blue LED turns on solid
- Multi-function button Off
- Press the multi-function button 3 times
- Entering special mode

B: Selecting mode

Press the multi-function button → LED indicator changes: B1(*) → B2 → B3 → B4 → B5(*) → B1 → ...

- B1 Blue LED lighting = Cutter drive setting mode(*) → Cover close → C1
- B2 Red LED lighting = DHCP timeout setting mode → Cover close → C2
- B3 Purple LED lighting = USB serial number setting mode → Cover close → C3
- B4 Blue LED flashing (Cycle: 0.5 sec) = Printer setup initialization mode → Cover close → C4
- B5 Red LED flashing (Cycle: 0.5 sec) = Cut method setting mode(*) → Cover close → C5

(*) Standard model only

C: Selecting setting items

When the settings are saved, the Power LED lights up blue. It then returns to standby status, and saving of the settings is completed.

- C1 Cutter drive setting mode → Press the multi-function button → LED indicator changes: C1-1 → C1-2 → C1-3 → C1-1 ...
 - C1-1 Blue flashing (Cycle: 0.25 sec) = Cutter enabled → Press and hold the multi-function button for 1 second → Save settings
 - C1-2 Red flashing (Cycle: 0.25 sec) = Cutter disabled [1] (tear bar position feed) → Press and hold the multi-function button for 1 second → Save settings
 - C1-3 Purple flashing (Cycle: 0.25 sec) = Cutter disabled [2] (Cutting position feed) → Press and hold the multi-function button for 1 second → Save settings
- C2 DHCP timeout setting mode → Press the multi-function button → LED indicator changes: C2-1 ⇔ C2-2
 - C2-1 Blue flashing (Cycle: 0.25 sec) = DHCP timeout enabled → Press and hold the multi-function button for 1 second → Save settings
 - C2-2 Red flashing (Cycle: 0.25 sec) = DHCP timeout disabled → Press and hold the multi-function button for 1 second → Save settings
- C3 USB serial number setting mode → Press the multi-function button → LED indicator changes: C3-1 ⇔ C3-2
 - C3-1 Blue flashing (Cycle: 0.25 sec) = USB serial number enabled → Press and hold the multi-function button for 1 second → Save settings
 - C3-2 Red flashing (Cycle: 0.25 sec) = USB serial number disabled → Press and hold the multi-function button for 1 second → Save settings
- C4 Printer settings initialization mode
Printer settings initialization

C5 Cut method setting mode

→ Press and hold the multi-function button → LED indicator changes: C5-1 → C5-2 → C5-3 → C5-1 ...

C5-1 Blue flashing (Cycle: 0.25 sec) = Partial cut fixed → Press and hold the multi-function button for 1 second → Save settings

C5-2 Red flashing (Cycle: 0.25 sec) = Full cut fixed → Press and hold the multi-function button for 1 second → Save settings

C5-3 Purple flashing (Cycle: 0.25 sec) = Command override → Press and hold the multi-function button for 1 second → Save settings

4.2.6. Special function setting mode (normal waiting)

* Procedure for special function settings: A → B → C

A: Entering special mode

Cover open + Press the multi-function button

- Red LED lighting for 5 seconds
- Red LED flashing (Cycle: 0.5 sec)
- Multi-function button Off
- Entering special mode

B: Selecting mode

Press the multi-function button → LED indicator changes: B1 → B2(*) → B3 → B4 → B5 → B1 → ...

- B1 Red LED flashing (Cycle: 0.5 sec) = USB-C function setting mode → Cover close → C1
- B2 Blue LED lighting = Hold print control setting mode(*) → Cover close → C2
- B3 Red LED lighting = Paper setting mode → Cover close → C3
- B4 Purple LED lighting = Paper leading edge detection mode → Cover close → C4
- B5 Blue LED flashing (Cycle: 0.5 sec) = Sensor adjustment mode (BM) → Cover close → C5
- B6 Purple LED flashing (Cycle: 0.5 sec) = Sensor adjustment mode (GAP) → Cover close → C6

Note 1) Load the paper with BM before executing the sensor adjustment mode (BM).

2) Load the die cut paper before executing the sensor adjustment mode (GAP).

3) If sensor adjustment by sensor adjustment mode (BM) or sensor adjustment mode (GAP) fails, approximately 30 cm of paper is ejected and the printer then stops. Check that the paper is installed correctly and that the sensor position is correct, then perform sensor adjustment again.

(*) Standard model only

C: Selecting setting items

When the settings are saved, the Power LED lights up blue. It then returns to standby status, and saving of the settings is completed.

- C1 USB-C function setting mode → Press the multi-function button → LED indicator changes: C1-1 → C1-2 → C1-3 → C1-1 ...
 - C1-1 Red flashing (Cycle: 0.5 sec) = Communication only → Press and hold the multi-function button for 1 second → Save settings
 - C1-2 Blue flashing (Cycle: 0.5 sec) = Power supply only → Press and hold the multi-function button for 1 second → Save settings
 - C1-3 Purple flashing (Cycle: 0.5 sec) = Power supply + communication → Press and hold the multi-function button for 1 second → Save settings

- C2 Hold print control setting mode → Press the multi-function button → LED indicator changes: C2-1 ↔ C2-2
 - C2-1 Blue flashing (Cycle: 0.5 sec) = Hold print control enabled → Press and hold the multi-function button for 1 second → Save settings
 - C2-2 Red flashing (Cycle: 0.5 sec) = Hold print control disabled → Press and hold the multi-function button for 1 second → Save settings

- C3 Paper setting mode → Press the multi-function button → LED indicator changes: C3-1(*) → C3-2 → C3-3(*) → C3-4 → C3-1...
 - C3-1 Blue flashing (Cycle: 0.25 sec)(*) = Linerless label paper → Press and hold the multi-function button for 1 second → Save settings
 - C3-2 Red flashing (Cycle: 0.25 sec) = Die cut label paper → Press and hold the multi-function button for 1 second → Save settings
 - C3-3 Purple flashing (Cycle: 0.25 sec)(*) = Full-surface label paper → Press and hold the multi-function button for 1 second → Save settings
 - C3-4 Blue flashing (Cycle: 0.25 sec) = Receipt paper → Press and hold the multi-function button for 1 second → Save settings

- C4 Paper leading edge detection mode → Press the multi-function button → LED indicator changes: C4-1 → C4-2 → C4-3 → C4-1 → ...
 - C4-1 Blue flashing (Cycle: 0.5 sec) = BM mode → Press and hold the multi-function button for 1 second → Save settings
 - C4-2 Purple flashing (Cycle: 0.5 sec) = GAP mode → Press and hold multi-function button for 1 second → Save settings
 - C4-3 Red flashing (Cycle: 0.5 sec) = Paper leading edge detection disabled → Press and hold the multi-function button for 1 second → Save settings

- C5 Sensor adjustment mode (BM)
BM sensor adjustment

- C6 Sensor adjustment mode (GAP)
GAP sensor adjustment

(*) Standard model only

4.2.7. Special function setting mode (no paper) [Standard model only]

Cover close + No paper error occurrence (Power LED continuous red flashing (Cycle: 1 sec))

- Press and hold the multi-function button for 5 seconds
- Cleaning notification cancellation (If the Information LED is illuminated orange, it turns off)
- Multi-function button Off
- Press and hold the multi-function button for 5 seconds within 2 seconds
- Parts replacement notification cancellation (If the Information LED is illuminated red, it turns off)

4.3. RESET switch

4.3.1. Initializing communication settings

By initializing the communication settings, 3.1.1 Wired LAN (Ethernet) interface (3) Setting items, 3.1.2.2 Wireless LAN setting items, and 3.3.3 Bluetooth settings can be initialized.

To communicate via a connected access point after initializing the wireless LAN settings, you need to reconfigure the wireless LAN settings.

If you want communication with a paired connection device after Bluetooth settings are initialized, it is necessary to pair the device again.

Perform the communication setting initialization in the order of A → B.

A: Entering communication settings initialization mode

Turn the printer power OFF, and while holding down the RESET switch on the rear of the printer with a pen or a similar object that has a fine point, turn the power ON.

When the Network LED starts flashing green (cycle: 0.5 sec), release the RESET switch to enter the special mode.

→ To B: Selecting mode

B: Selecting mode

Press and hold the multi-function button → LED indicator changes: B1 ⇒ B2 (Wireless model) ⇒ B3 (Wireless model) ⇒ B1 ⇒ ...

Status	LED indicator		Selected mode
	Wired model	Wireless model	
B1	Network LED Green flashing (Cycle: 0.5 sec)	Network LED Green flashing (Cycle: 0.5 sec)	Network settings initialization mode
B2	-	Bluetooth LED Blue flashing (Cycle: 0.5 sec)	Bluetooth settings initialization mode
B3	-	Network LED Green flashing (Cycle: 0.5 sec)/ Bluetooth LED Blue flashing (Cycle: 0.5 sec)	Network & Bluetooth settings initialization mode

→ Press and hold the multi-function button → Release the multi-function button when the printer reset is initialized.

[B1 Network settings initialization mode selection is confirmed]

The network settings are initialized and the printer is reset to resume normal mode.

[B2 Bluetooth settings initialization mode selection is confirmed]

The Bluetooth settings are initialized and the printer is reset to resume normal mode.

[B3 Network & Bluetooth settings initialization mode selection is confirmed]

The network settings and Bluetooth settings are initialized and the printer is reset to resume normal mode.

4.3.2. Auto Connection setting change

This section applies only to wireless models that support Bluetooth communication.

For supported models, refer to the Interface field in "2.1 General specifications".

You can change the Auto Connection settings according to the following operation:

If enabled, the setting will be disabled; if disabled, the setting will be enabled.

Load paper, turn on the power, and bring the printer in the standby status.

Press and hold the RESET switch on the back of this printer for more than 3 seconds to apply the setting changes.

It takes several seconds to complete the settings change. Once the Power LED is off, the settings change is complete.

Perform self-printing to verify that the setting is correct.

4.4. LED indicator and errors

4.4.1. Automatic recovery error (Online)

Error type	Power LED	Cause	Restoration method
High head temperature detection (Printing stop)	Blue flashing (1 time)	The head temperature is high.	Automatically recovered when head temperature drops.
Circuit board high temperature detection (Printing stop)	Blue flashing (2 times)	The circuit board temperature is high.	Automatically recovered when the circuit board temperature drops.

4.4.2. Recoverable error (Offline)

Error type	Power LED	Cause	Restoration method
Cover open error	Lighting up red	The cover is open.	Close the cover.
No paper error(*1)	Continuous red flashing (Cycle: 1 sec)	There is no paper.	Load paper.
BM/GAP sensor Detection error(*2)	Continuous red flashing (Cycle: 1 sec)	The BM/GAP cannot be detected accurately.	Perform sensor adjustment. Check to see if the position of the mark detection sensor is correct. Make sure that the paper in use is correct.
Paper jam error(*3)	Continuous red flashing (Cycle: 0.25 sec)	Paper jam occurred.	Remove any jammed paper. If paper jam occurs frequently, clean the parts.

*1 Only when mark detection is disabled

*2 Only when mark detection is enabled

*3 Standard model only

4.4.3. Irrecoverable error (Offline)

Error type	Power LED	Cause	Restoration method
Auto cutter error(*)	Continuous purple flashing (Cycle: 0.25 sec)	Paper jam or cutter malfunction	Turn the power OFF and eliminate the cause of the error. After confirming that the cutter blade has returned to the home position, turn ON the power. If the error cannot be cleared, the printer must be repaired.
Star Configuration Format error	Continuous purple flashing (Cycle: 1.00 sec)	• Description error is detected in Star Configuration Format • USB memory disconnect is detected	Turn the power OFF. After confirming that the description of the Star Configuration Format is correct, turn ON the power.
Supply voltage error	Purple flashing (1 time)	The power supply voltage is abnormal (While waiting) (26.4 V or more/21.2 V or less)	The printer must be repaired.
Head thermistor error	Purple flashing (2 times)	Head thermistor resistance is at abnormal value (80°C or more/-20°C or less)	The printer must be repaired.
FLASH error	Purple flashing (4 times)	FLASH access is faulty.	The printer must be repaired.
EEPROM error	Purple flashing (5 times)	EEPROM access is faulty.	The printer must be repaired.
RAM error	Purple flashing (6 times)	External RAM access is faulty.	The printer must be repaired.
Firmware rewriting error	Purple flashing (7 times)	• Anomaly detection of received firmware data • Verify error detection after rewrite	Turn OFF the power and then ON again. If the same error occurs, the printer must be repaired.
Firmware operation error	Purple flashing (8 times)	Firmware malfunction anomaly detection	Turn OFF the power and then ON again. If the same error occurs, the printer must be repaired.

* Standard model only

If you need help with repairs, please contact the seller that you purchased the printer.

4.4.4. Network link status display

(1) Wired LAN (Ethernet) interface

Type	Network LED	Cause	Restoration method
Link up	On	TCP/IP communication possible	
Link down [Physical disconnection]	Off	Connection physically cuts off (Ethernet is link down)	Check the connection of the communication cable between the printer and hub router, and turn the power ON again.
Link down [IP address not acquired]	Flash (Cycle: 0.25 sec)	<When DHCP is enabled> It is not possible to acquire an IP address from the network, or an ARP/Ping address has been acquired.	After confirming the wiring path and the DHCP server, turn the power ON again
		<When DHCP is disabled> IP address = 0.0.0.0 is specified	After initializing the network settings, set the correct IP address.

(2) Wireless LAN interface (wireless model)

Type	Network LED	Cause	Restoration method
Link up [Wireless LAN Infrastructure mode]	Lighting up green	TCP/IP communication possible	
Link up [Wireless LAN AP mode]	Lighting up green	One or more terminals are connected to the printer	
Link down [Wireless LAN Infrastructure mode]	Off	Connection with access point was disconnected	Check that the connection destination access point is running, and that the printer wireless LAN settings are correct, and then turn the power ON again.
Link down [Wireless LAN AP mode]	Off	No terminal is connected to the printer	
Link down [IP address not acquired]	Green flashing (Cycle: 0.25 sec)	<When DHCP is enabled> It is not possible to acquire an IP address from the network, or an ARP/Ping address has been acquired.	Check the wiring path and the DHCP server, and then turn the power ON again
		<When DHCP is disabled> IP address = 0.0.0.0 is specified	Initialize the network settings, and set a correct IP address

*1) Run ARP/Ping if you want to set a temporary IP address.

4.4.5. Bluetooth status display (wireless model only)

Type	Bluetooth LED
Ready status (pairing/connection possible)*1	Off
Connected	On

*1: When the [New Pairing Permission] settings are OFF, pairing is not possible even in the ready state.

4.4.6. Firmware status display

Type	Power LED
Writing firmware (Printing stop)	Continuous red and blue alternate flashing (Cycle: Irregular)

4.4.7. USB host status display

Type	Power LED
When the device is connected to a charger or an unsupported USB device	Continuous red and blue alternate flashing (5 sec, Cycle: 1 sec)
When connected to an unsupported USB or HUB (When more than the prescribed number of levels are connected)	Continuous red and blue alternate flashing (5 sec, Cycle: 0.5 sec)

4.4.8. Information display

Type	Information LED	Notification contents	Notification cancel method
During hold print, notification of stuck print job	Blue flashing (Cycle: 1 sec)	The following print data is in standby state due to hold print control	Pull out the ejected paper
Cleaning notification	Lighting up orange	It is time for parts cleaning	Clean the parts and cancel the cleaning notification *1
Parts replacement notification	Lighting up red	It is time for parts replacement	Replace the parts and cancel the parts replacement notification *2

*1: See "5.1.1 Notification, cancellation".

*2: See "5.3.1 Notification, cancellation".

5. Maintenance

For comfortable and safe use, perform maintenance periodically.

Please read the following precautions carefully before performing maintenance.

Warning

- Be sure to turn off the power before performing maintenance.
Otherwise, it may cause electric shock or injury if the power is on during maintenance.
- Do not perform maintenance with wet hands.
Doing so may cause electric shock.
- Periodically maintain the power cable.
If usage of a damaged (e.g. cracked) cable is continued, it may cause fire or electric shock.

Caution

- Do not use benzine, thinner, trichloroethylene, and ketone solvents. Do not also dampen or damage the interior of this product during maintenance. Otherwise, it may lead to malfunctions.
- Do not touch any of the other interior sections that are not noted in this product manual. Otherwise, it may cause an injury or burns.
- The thermal head is easily damaged. Be careful not to damage it while cleaning.
- Do not clean the thermal head immediately after printing when it is still hot.
- There is risk that static electricity may damage the head after the thermal head is cleaned so be careful about static electricity.
- For models with built-in auto cutter, be very careful when touching the blade of the cutter during cleaning or part replacement.
- It is recommended to promptly remove any glue accumulating on the blade of the cutter unit, as it can cause malfunction.

5.1. Parts cleaning (when using linerless label paper or continuous label paper) [Standard model only]

<Standard for when parts need to be cleaned>

- 1) Information LED: When lighting up orange (This notification is based on the cleaning cycle of strong adhesive linerless.)
- 2) If accidental defects, such as paper jam, defective cutting, and hold print sensor incorrect detection occur
- 3) If the stickiness of parts due to label papers is bothersome during paper roll replacement

5.1.1. Notification, cancellation

The LED indicator notifies when it is time for parts cleaning. For details, see "4.4.8 Information display".

In addition, when the cover is opened and closed while the LED indicator is on, printing is performed, notifying that it is time for parts cleaning.

You can cancel the cleaning notification using special mode or command.

To cancel the notification using special mode, refer to "4.2.9 Special function setting mode (no paper)".

To cancel the notification using a command, refer to the Commands Specifications.

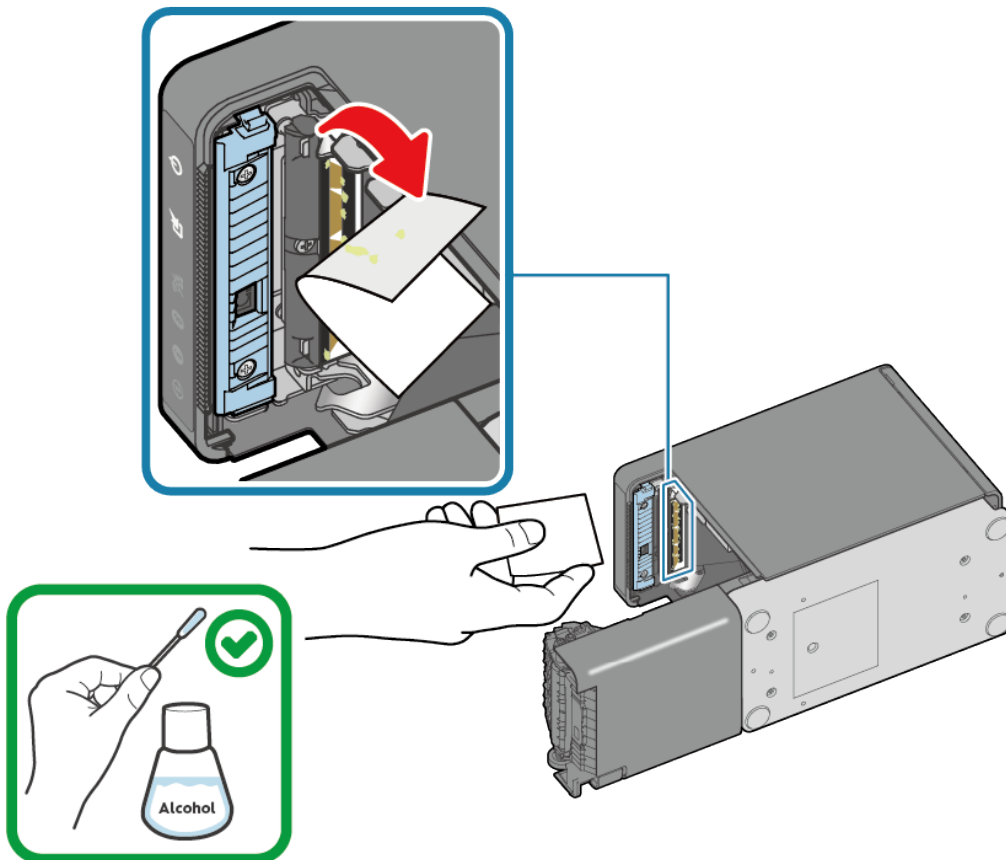
LED indicator and printing notification may be disabled by using Star Configuration.

5.1.2. Thermal head

Press the label paper against the thermal head several times to remove dirt and glue from the heating element of the thermal head.

If the thermal head is extremely dirty, apply alcohol solvent (ethanol, methanol, isopropyl alcohol) on a cotton swab and remove dirt from the heating element of the thermal head.

- Note 1) If the label paper used for cleaning is torn and stuck to the thermal head, remove it by hand.
- 2) Commercially available adhesive tape (cellophane tape, etc.) may be used instead of the label paper.

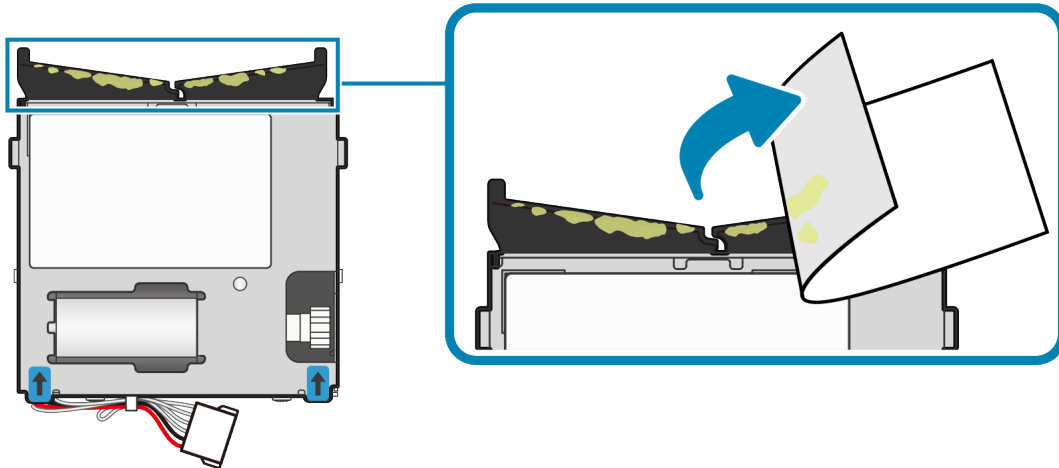


5.1.3. Cutter

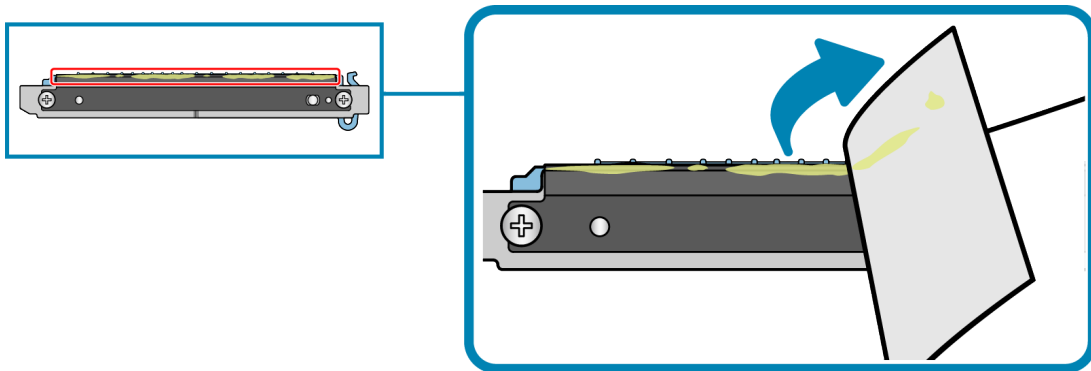
For adhering glue residue (see figure below), press the adhesive surface of the label used several times to remove the stickiness.

- Note 1) If the label paper used for cleaning is torn and stuck to the cutter, remove it by hand.
2) Commercially available adhesive tape (cellophane tape, etc.) may be used instead of the label paper.

- Cutter unit



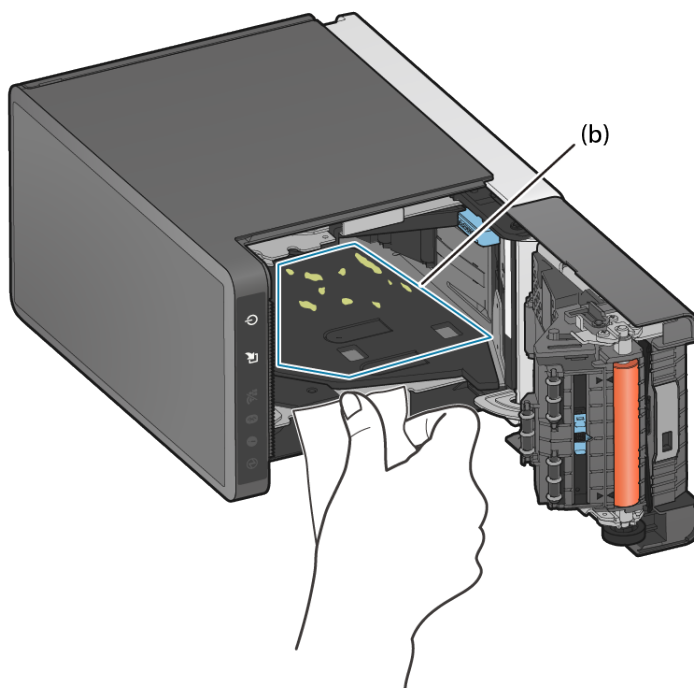
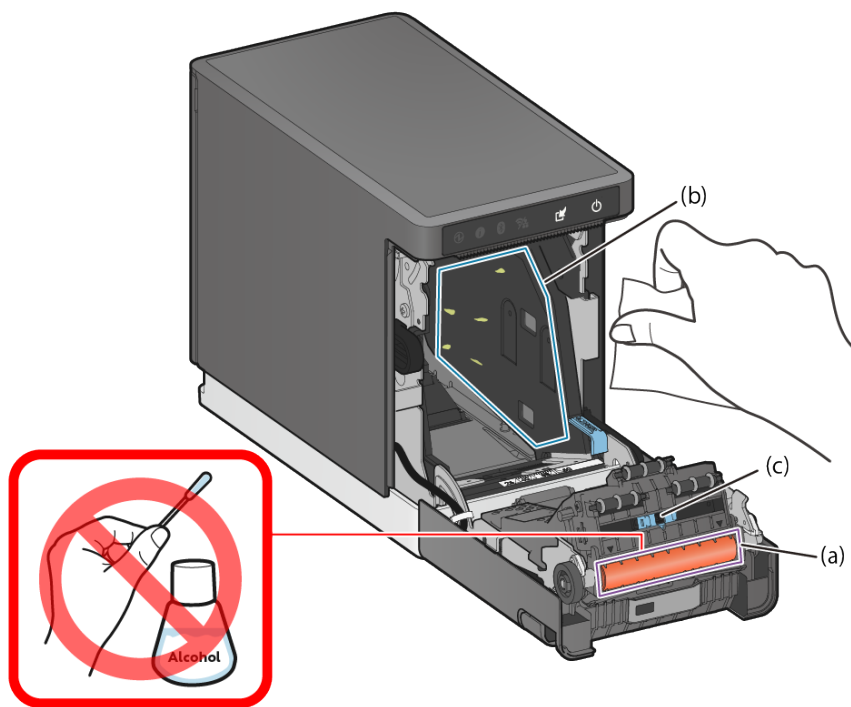
- Stationary knife

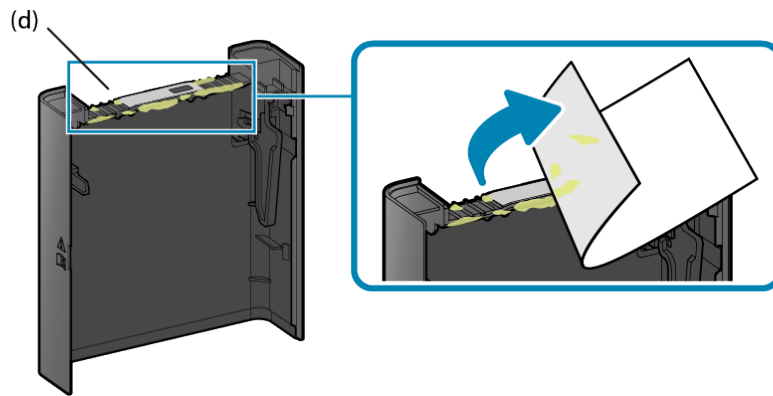


5.1.4. Platen roller and paper feed path

Press the adhesive surface of the label against the glue adhered to the areas (a) to (d) in the figure below several times until the stickiness is removed.

- Note 1) If the label paper used for cleaning is torn and stuck to the paper feed path, remove it by hand.
- 2) Commercially available adhesive tape (cellophane tape, etc.) may be used instead of the label paper.
 - 3) Because a special treatment has been applied to the platen roller for the standard model, never use alcohol solvents.
 - 4) For protection of hands and fingers, it is recommended to wear gloves when performing cleaning work.

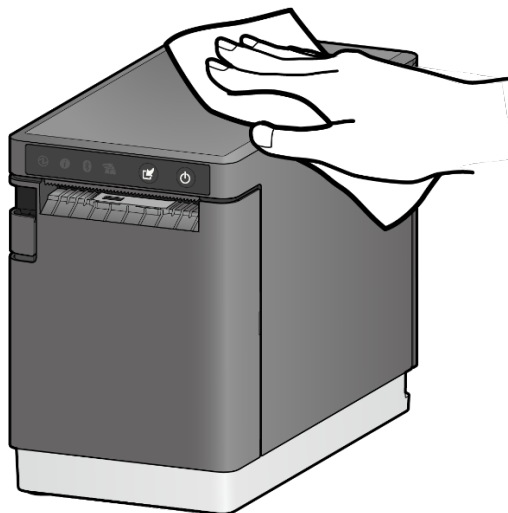




- (a) Platen roller [Purple frame]
- (b) Left and right paper guides [Blue frame]
- (c) PE/BM sensor
- (d) Top surface of front cover [Blue frame]

5.1.5. External view

- Wipe off the dirt on the plastic section using a soft, dry, and clean cloth.
- If it is very dirty, soak a soft cloth in water containing a very small amount of neutral detergent, completely wring out the cloth and gently wipe off the dirt. Wipe off any moisture using a soft, dry cloth.



5.2. Parts cleaning (When using die cut label paper or receipt paper)

<Standard for when parts need to be cleaned>

- 1) Every six months, or every one million printed lines

5.2.1. Thermal head

- Put an alcohol solvent (ethanol, isopropyl alcohol) on a cotton swab (or soft cloth) and wipe the thermal area of the thermal head.
- Remove the blackened paper powder from the surface of the thermal head.

5.2.2. Platen roller

- Use a soft, dry cloth to wipe off the dirt from the platen roller.
- Rotate the rubber roller while cleaning to make sure that the whole roller is cleaned.

5.2.3. Paper feed path

- Remove any debris, dust, and paper particles from the paper holder as well as any other objects that may have accumulated.

5.2.4. External view

- Wipe off the dirt on the plastic section using a soft, dry, and clean cloth.
- If it is very dirty, soak a soft cloth in water containing a very small amount of neutral detergent, completely wring out the cloth and gently wipe off the dirt. Wipe off any moisture using a soft, dry cloth.

5.3. Parts replacement [Standard model only]

When it is time for parts replacement, replace the platen roller and cutter together.

To purchase a platen roller or cutter, contact your local distributor.

<https://www.star-m.jp/mclabel2-sup.html?#a4>

<Standard for when parts need to be replaced>

- 1) Information LED: Lighting up red (when the media setting is linerless label paper or continuous label paper)
- 2) If defects, such as paper jam and defective cutting, occur even immediately after cleaning parts
- 3) If there is obvious damage to the part

5.3.1. Notification, cancellation

The LED indicator notifies when it is time for parts replacement. For details, see "4.4.8 Information display".

In addition, when the cover is opened and closed while the LED indicator is on, printing is performed for notification that it is time for parts replacement.

After performing parts replacement, cancel the notification regardless of whether or not there is a notification by the LED indicator. Canceling the parts replacement notification updates the next parts replacement notification timing.

You can cancel the parts replacement notification using special mode or command.

To cancel the notification using special mode, refer to "4.2.9 Special function setting mode (no paper)".

To cancel the notification using a command, refer to the Commands Specifications.

LED indicator and printing notification may be disabled by using Star Configuration.

5.3.2. Cutter

Be sure to replace the cutter unit and the stationary knife together.

If only one side is replaced, phenomena such as defective cutting may occur.

5.3.3. Platen roller

If the replacement platen roller is dirty or has dust, clean it before use.

6. Log Function

6.1. Interface log

This product stores information as logs regarding "when and which interface was used for communication". By reading the logs, it is possible to accurately understand the printer's usage environment, making it useful for troubleshooting, etc.

The logs saved are up to the most recent 10 entries. The types of log are as listed below.

If log events with the same interface and event type occur consecutively, new logs are not saved, and only the time of the relevant log is updated.

- Interface (Ethernet, USB, Bluetooth, etc.)
 - Event (Data reception, link up/link down, connection/disconnection, etc.)
 - Time of event occurrence or elapsed time since printer startup (*)
- * If a LAN cable is connected to the printer and time can be obtained from an NTP server, the time is saved. If time cannot be obtained, the elapsed time since printer startup is saved.

Logs are saved to non-volatile memory at following timings.

- Every 5 minutes after printer startup
- Before power OFF using the power button
- Before hardware reset
- Before execution of log information send command (ESC GS J)

The saved logs can be confirmed via command, Star Quick Setup Utility, or printer saved information print mode.

The types of interfaces and events saved as log are as follows.

Interface	Event	Description
Ethernet	Link Up	Ethernet link is up.
	Link Down	Ethernet link is down.
	Internet Access OK	Accessed the Internet. (*1)
	Internet Access None	Cannot access the Internet. (*1)
	Data Received	Data is received via Ethernet (TCP#9100).
USB (Printer Class)	Connected	Connected to a Windows or Android device using USB printer class.
	Disconnected	Connection to a Windows or Android device using USB printer class was disconnected.
	Data Received	Data was received from a Windows or Android device using USB printer class.
USB (AOA)	Connected	Connected to an Android device using USB AOA protocol.

Interface	Event	Description
	Disconnected	Connection to an Android device using USB AOA protocol was disconnected.
	Data Received	Data was received from an Android device using USB AOA protocol.
USB (iAP2)	Connected	Connected to an iOS device via USB.
	Disconnected	USB connection to an iOS device was disconnected.
	Data Received	Data was received from iOS device via USB.
Bluetooth	Connected	Connected to a Windows or Android device via Bluetooth.
	Disconnected	Bluetooth connection to a Windows or Android device was disconnected.
	Data Received	Data was received from a Windows or Android device via Bluetooth.
Bluetooth (iAP2)	Connected	Connected to an iOS device via Bluetooth.
	Disconnected	Bluetooth connection to an iOS device was disconnected.
	Data Received	Data was received from an iOS device via Bluetooth.
WLAN Access Point Mode	Started	Started in access point mode.
	Connected	Connected to a terminal in access point mode. (*2)
	Data Received	Data was received in access point mode.
WLAN Infrastructure Mode	Started	Started in infrastructure mode.
	AP Connected	Already connected to an access point.
	AP Connect Failed	Initial connection to an access point failed.
	AP Disconnected	Connection to the access point was disconnected
	IP Address Obtained	IP address has been obtained. (*3)
	IP Address Not Obtained	Could not obtain IP address. (*3)
	Internet Access OK	Accessed the Internet. (*4)
	Internet Access None	Cannot access the Internet. (*4)
	Data Received	Data was received in infrastructure mode.
CloudPRNT (HTTP)	POST Response Success	HTTP POST method request succeeded.
	POST Response Failure	Server responded with other than a success response to an HTTP POST method request.
	POST Request Failed	There was no response from the server for an HTTP POST method request.
	GET Response Success	HTTP GET method request succeeded.
	GET Response Failure	Server responded with other than a success response to an HTTP GET method request.
	GET Request Failed	There was no response from the server for an HTTP GET method request.
	DELETE Response Success	HTTP DELETE method request succeeded.

Interface	Event	Description
	DELETE Response Failure	Server responded with other than a success response to an HTTP DELETE method request.
	DELETE Request Failed	There was no response from the server for an HTTP POST method request.
CloudPRNT (MQTT)	Connected	Connected to MQTT broker.
	Disconnected	Disconnected from MQTT broker.
	Data Received	MQTT message was received.

*1: In the case of "link up", either "Internet Access OK" or "Internet Access None" log is saved.

*2: When connected to multiple terminals, terminals cannot be distinguished.

*3: In the case of "AP Connected", either "IP Address Obtained" or "IP Address Not Obtained" log is saved.

*4: In the case of "IP Address Obtained", either "Internet Access OK" or "Internet Access None" log is saved.

7. Firmware Update

The following are the methods for updating the firmware of this product.

Method	Reference
Star Quick Setup Utility	Update the firmware using an iOS or Android device. iOS : App Store Android : Google Play
Star Windows Software	Update the firmware using a Windows device. Download site
USB flash drive	Update the firmware using a USB flash drive. Procedure for Firmware Rewriting Using USB Flash Drive
Star CloudPRNT (*)	Update the firmware remotely from the remote server. Star CloudPRNT Protocol Guide
SMCS Device Manager API (*)	Using the OAuth 2.0 authorization code flow, update the firmware remotely with WebAPI. Device Manager API

*) This is a developer-oriented solution, assuming integration into an application.

8. Application Development

The following software is useful when developing applications to control this product.

8.1. Supported emulation

StarPRNT emulation

8.2. Software

I Development kit I

Name	General description
StarXpand SDK for iOS/Android	This is a development kit to control the printer from a native application. This is a new SDK that updated the StarPRNT SDK. Manual: https://www.star-m.jp/starxpandsdk-oml.html
StarXpand SDK for ReactNative	This is a development kit to control the printer from a native application using ReactNative. Manual: https://www.star-m.jp/react-native-stario10-oml.html
StarPRNT SDK	This is a development kit to control the printer from a native application. Manual: https://www.star-m.jp/starprntsdk-oml-android.html
Star Micronics Cloud Services	This service allows access to printer data by connecting Star Micronics printers to the Star Micronics Cloud. Manual: https://www.starmicronicscloud.com
StarWebPRNT SDK	This is a development kit to print from a variety of devices, such as PCs and tablets, through a web browser. Manual: https://www.star-m.jp/starwebprnt-oml.html
Star PassPRNT SDK	A development kit for performing call printing from other applications by the URL scheme. You can receive print data and print it on Star Micronics printer. Manual: https://www.star-m.jp/starpassprntsdk-oml-android.html
Star CloudPRNT SDK	Star CloudPRNT is a protocol that can print from a remote server. Manual: https://www.star-m.jp/starcloudprntsdk-oml.html
Star Document Markup	It allows anyone to create print data intuitively without the need to understand complex printer control commands. Manual: https://www.star-m.jp/StarDocumentMarkup-oml.html

I Driver I

Name	General description	Operating environment
Star Windows Driver	This is required when using the Star Micronics printer with the Windows printer driver. The Windows printer driver is used when printing from a Windows application. Included in Star Windows Software.	Windows
Star OPOS Driver	This is required when using the Star Micronics printer and peripheral devices with the OPOS driver. Included in Star Windows Software.	Windows
Star JavaPOS Driver	This is required when using Star Micronics printers and peripherals with the JavaPOS driver.	Windows, Linux, macOS
Star CUPS Driver	This is required when using Star Micronics printers and peripherals with the CUPS driver.	Linux, macOS, ChromeOS

I Utility I

Name	General description	Operating environment
Star Quick Setup Utility	This allows you to perform communication settings and initial settings, check printer operation, and change printer settings.	iOS, Android
Star Windows Software	Provides Star Windows Driver and Star OPOS Driver as well as various setting utilities. The setting utilities can be used to change the printer settings.	Windows

I Download I

You can download various software and manuals from the following website.

<https://www.star-m.jp/supportsite-wsw.html>

I Authentication process of applications for MFi-supported printers I

If you design and develop an iOS application compatible with Star Micronics MFi authentication printers and register it on the Apple App Store, please check the following URL.

Japanese : <https://www.star-m.jp/prjump/000173.html>

English : <https://www.star-m.jp/prjump/000174.html>

9. Star Configuration Format

Star Configuration defines how to update the printer firmware and settings change.

This chapter describes the combinations of Star Configuration Key and Value that can be set with mC-Label2.

"default" in the table below means the factory default setting.

For more information about Star Configuration rewriting method, see the Star Configuration Format specifications.

Because the following keys support setting only, acquisition of the Star Configuration setting values is not supported.

- print_when_completed_type
- print_when_completed
- firmwares
- configurations->print_type
- configurations->print_before_writing
- configurations->reset_settings_to_default
- configurations->selftest_after_writing
- configurations->password_protected_settings->current_password
- configurations->password_protected_settings->new_password
- configurations->password_protected_settings->cloudprnt->https_trust_level_path_type
- configurations->password_protected_settings->cloudprnt->https_trust_level_path

Key	value	Remarks
title	"star_configuration"	-
version	Star Configuration Version	-
print_when_completed_type	"none"	-
	"ascii"	-
print_when_completed	Notification print contents when firmware update and settings change are completed	-
firmwares		
action	"upgrade"	-
	"force"	-
device_name	Model name subject to firmware update	-
path_type	"url"	-
	"path"	-
	"cloud"	-

		"internal_file"	-
	path	Details on the acquisition method specified in "path_type"	-
	print_type	"none"	-
		"ascii"	-
	print_before_writing	Notification print contents before performing firmware update	-
	selftest_after_writing	"none"	-
		"all"	-
		"bluetooth"(*1)	-
		"network"	-
		"printer"	-
		"printer_diff"	-
		"factory"	-
		"version"	-
configurations			
	device_name	"all"	-
		"<device_name>"	-
	print_type	"none"	-
		"ascii"	-
	print_before_writing	Notification print contents before performing settings change	-
	reset_settings_to_default	"none"	-
		"all"	-
	selftest_after_writing	"none"	-
		"all"	-
		"bluetooth"(*1)	-
		"network"	-
		"printer"	-
		"printer_diff"	-
		"factory"	-

					"version"	-
					password_protected_settings	
					current_password	Login password for Web Configuration
					new_password	New login password for Web Configuration
					cloudprnt	
					service	"default"
						"disabled"
						"enabled"
					server_url	"default"
						Other Specified URL
					polling_time	"_1"
						"1 to 7200"
					user_name	"default"
						Other Specified user name
					password	"default"
						Other Specified password
					https_trust_level	"default"
						"list"
						"custom"
						"all"
					https_trust_level_path_type	"url"
						"path"
						"internal_file"
					https_trust_level_path	Details on the acquisition method specified in "https _ trust _ level _ path _ type"
					ntp_server	"default"
						"star"
						"custom"
					ntp_server_option	"default"

					Other Specified URL	-	
				cipher_suites_encryption_level	"default"	-	
					"high+medium"	-	
					"medium"	-	
				use_tls_13	"default"	-	
					"disabled"	-	
					"enabled"	-	
				interface			
				network			
				target_device	"eth0"	-	
					"wlan0" (*1)	-	
				dns			
				dns1	"default"	-	
					"0.0.0.0" to "255.255.255.255"	-	
				dns2	"default"	-	
"0.0.0.0" to "255.255.255.255"	-						
wlan (*1)							
network_mode	"default"						
	"access_point_mode"						
	"infrastructure_mode"						
ssid	ssid setting						
security_type	"wpa"						
	"wpa2"						
	"wpa3"						
	"open"						
	"auto"						
security_key	Security Key setting						
auto_reset	"default"						
	"disabled"						

						"enabled"		
		smcs						
			control			"default"	-	
						"disabled"	-	
						"enabled"	-	
		printer_control						
		media_type				"default"	-	
	"linerless_label" (*2)					-		
	"die_cut_label"					-		
	"continuous_label" (*2)					-		
	"receipt"					-		
	print_width				"default"	-		
					"15 mm" to "56 mm" (*2) (Set in 1 mm unit)	-		
					"34.5mm"	-		
					"48.7mm"	-		
					"50.8mm"	-		
					"52.5mm"	-		
					"56.9mm"	-		
	reverse_printing				"default"	-		
					"disabled"	-		
					"enabled"	-		
	print_startup_control				"default"	-		
					"page"	-		
					"line"	-		
	print_speed				"default"	-		
					"high"	-		
					"medium"	-		
					"low"	-		
	print_density				"default"	-		
					"standard"	-		
					"0"	-		
					"+1"	-		
					"+2"	-		

			" +3"	-		
			" -1"	-		
			" -2"	-		
			" -3"	-		
		line_feed_amount	"standard"	-		
			"narrow"	-		
		processing_after_error_recovery	"default"	-		
			"discard"	-		
			"reprint"	-		
		cutter_operation (*3)	"default"	-		
			"enabled"	-		
			"no_cut_with_feed _to_cutter"	-		
			"no_cut_with_feed _to_tearbar"	-		
		cut_type (*3)	"default"	-		
			"follow_command"	-		
			"partial_cut"	-		
			"full_cut"	-		
		top_margin	"default"	-		
			"3mm"	-		
			"4 mm" to "10 mm"	-		
			"10mm"	-		
			"12 mm" to "15 mm"	-		
		printer_status				
			asb	ethernet	"default"	-
					"disabled"	-
					"enabled"	-
				Bluetooth(*1)	"default"	-
					"disabled"	-
"enabled"	-					
usb_b_c	"default"			-		
	"disabled"			-		
	"enabled"			-		

			usb_serial	"default"	-	
				"disabled"	-	
				"enabled"	-	
			wlan (*1)	"default"	-	
				"disabled"	-	
				"enabled"	-	
		nsb		ethernet	"default"	-
					"disabled"	-
					"enabled"	-
	usb_b_c			"default"	-	
				"disabled"	-	
				"enabled"	-	
	printer_button					
				multi_function_button	"default"	-
					"none"	-
		"feed_button"			-	
		"one_touch_label"			-	
		feed_button	"default"	-		
"disabled"			-			
"enabled"			-			
one_touch_label						
		number	1	-		
			2	-		
			3	-		
			logo_keycode	"default"	-	
				"none"	-	
				"XX"	-	
		cut_type (*3)	"default"	-		
			"none"	-		
			"partial_cut"	-		
			"full_cut"	-		
			"tear_bar"	-		
power_button		"default"	-			
		"disabled"	-			
	"enabled"	-				

printer_sensor			
top_search			
	control	"default"	-
		"disabled"	-
		"enabled"	-
	sensor	"default"	-
		"black_mark"	-
		"gap"	-
	power_on	"default"	-
		"keep"	-
		"feed"	-
		"cut"	-
		"feed_cut"	-
	cover_close	"default"	-
		"keep"	-
		"feed"	-
		"cut"	-
		"feed_cut"	-
	black_mark		
	mark_length_adjust	"default"	-
		"0mm"	-
		"1 mm" to "15 mm"	-
	stop_position_adjust	"default"	-
"0mm"		-	
"0.0mm"		-	
"-10.0 mm" to "-0.5 mm"		-	
"0.5 mm" to "300 mm"		-	
paper_ taken (*2)			
control	"default"	-	
	"disabled"	-	
	"enabled"	-	
timeout	"default"	-	
	"none"	-	

				"5min"	-		
				"10min"	-		
				"30min"	-		
			status	"default"	-		
				"disabled"	-		
				"enabled"	-		
			led	"default"	-		
				"disabled"	-		
				"enabled"	-		
			reduced_printing				
				horizontal_paper_saving	"default"	-	
					"disabled"	-	
	"enabled"	-					
	vertical_paper_saving	"default"		-			
		"disabled"		-			
		"enabled"		-			
	interface						
		general	interface_lock_timeout	"default"	-		
				"1" to "10"	-		
			communication_detection	"default"	-		
				"disabled"	-		
				"enabled"	-		
			bluetooth (*1)				
			device_name	"default"	-		
				Other Specified device name	-		
		ios_port_name	"default"	-			
			Other Specified port name	-			
		new_pairing	"default"	-			
			"disabled"	-			
			"enabled"	-			
		auto_connection	"default"	-			
			"disabled"	-			
"enabled"			-				

			control	"default"	-		
				"disabled"	-		
				"enabled"	-		
		ble (*1)	control	"default"	-		
				"disabled"	-		
				"enabled"	-		
			network	target_device	"eth0"	-	
					"wlan0" (*1)	-	
				web_refresh_time	"default"	-	
		"1" to "300"			-		
		dynamic					
		dhcp		"default"	-		
				"disabled"	-		
				"enabled"	-		
				dhcp_timeout	"default"	-	
					"disabled"	-	
					"enabled"	-	
		static					
		ip_address		"default"	-		
				"0.0.0.0" to "255.255.255.255"	-		
				subnet_mask	"default"	-	
			"0.0.0.0" to "255.255.255.255"		-		
			default_gateway	"default"	-		
				"0.0.0.0" to "255.255.255.255"	-		
		control (*1)	"default"	-			
			"disabled"	-			
			"enabled"	-			
		system_configurations	port9100	"default"	-		
				"disabled"	-		

					"enabled"	-				
				port9100_multi_session	"default"	-				
					"disabled"	-				
					"enabled"	-				
				port9100_data_timeout	"default"	-				
					"0"	-				
					"30"	-				
					"40"	-				
					"60"	-				
					"120"	-				
					"180"	-				
					"300"	-				
				port9101	"default"	-				
					"disabled"	-				
					"enabled"	-				
				udp22222	"default"	-				
					"disabled"	-				
					"enabled"	-				
				lpr	"default"	-				
					"disabled"	-				
					"enabled"	-				
				telnet	"default"	-				
					"disabled"	-				
					"enabled"	-				
				port80	"default"	-				
					"disabled"	-				
					"enabled"	-				
				tcp22222	"default"	-				
					"disabled"	-				
					"enabled"	-				
				disconnect_message	"default"	-				
					"disabled"	-				
					"enabled"	-				
				usb						
					usb_c_function	"default"	-			

				"power_communication"	-
				"power "	-
				"communication"	-
			serial_number	"default"	-
				"disabled"	-
				"enabled"	-
			serial_number_data	"default"	-
				8 or 16 digit half width upper-case alphanumeric characters: Specified serial number	-
			usb_serial		
			target_device	"device0"	
			baud_rate	"default"	
				"4800"	
				"9600"	
				"19200"	
				"38400"	
				"57600"	
				"115200"	
			data_length	"default"	
				"7"	
				"8"	
			parity	"default"	
				"none"	
				"even"	
				"odd"	
			handshake	"default"	
				"none"	
				"dtr"	
				"xonxoff"	
			busy_condition	"default"	

				"receive_buff_full_or_offline"	
				"receive_buff_full"	
character					
		character_code	"default"	-	
			"none"	-	
			"gb18030"	-	
			"big5"	-	
			"shift_jis"	-	
			"japanese_ank"	-	
		special_region	"default"	-	
			"standard"	-	
			"thai"	-	
		international_character	"default"	-	
			"<international character>"	-	
		large_font	"default"	-	
			"disabled"	-	
			"enabled"	-	
		code_page	"default"	-	
			"<code page>"	-	
		zero_style	"default"	-	
			"normal"	-	
			"slashed"	-	
		kanji_character_pitch	"default"	-	
			"standard"	-	
			"wide"	-	
		ank_character_pitch	"default"	-	
			"standard"	-	
			"wide"	-	
steadylan					
		control	"default"	-	
			"disabled"	-	
			"enabled"	-	
		mode	"default"	-	
			"ios"	-	

			"android"	-
			"windows"	-
			"all"	-
		maintenance (*2)		
		cleaning_notification_led	"default"	-
			"disabled"	-
			"enabled"	-
		cleaning_notification_print	"default"	-
			"disabled"	-
			"enabled"	-
		cleaning_notification_status	"default"	-
			"disabled"	-
			"enabled"	-
		replacement_notification_led	"default"	-
			"disabled"	-
			"enabled"	-
		replacement_notification_print	"default"	-
			"disabled"	-
			"enabled"	-
		replacement_notification_status	"default"	-
			"disabled"	-
			"enabled"	-

*1) Setting and reading are possible only with wireless models.

*2) Setting and reading are possible only with standard models.

*3) Setting and reading are possible only with cutter-equipped models.

◇ **Reference specifications**

Star Configuration Format Specifications : <https://www.star-m.jp/printersdks-wsw.html>

9.1. Star Configuration supplement

The following provides supplementary explanations for each Key and Value.

➤ reverse_printing

When this function is enabled and a print data length is less than 300 mm, print data is rotated by 180° by the following triggers.

When the print data length is 300 mm or more, the 180° rotation function is ignored.

If any of the following 180° rotation trigger commands is not sent consecutively after print data has been sent, the 180° rotation function is also ignored.

<180° rotation commands>

- Cut command : <ESC> d n
- Page break (form feed) command : <FF>

If the 180° rotation function is enabled when print data is registered in the Initialization macro, printing is not performed immediately upon power ON.

When the print data and the 180° rotation trigger command are received from the host, the print data is output with rotated by 180° along with the Initialization macro data.

However, if the print data from the host does not contain a trigger command, the 180° rotation is ignored.

➤ print_startup_control

This function selects the control at the time of print start (Detect Page End, Detect Line End).

When Detect Line End is selected, printing starts immediately. However, printing can sometimes be intermittent.

Compared to Detect Page End, print quality may be poor (appearance of white lines, etc.) or the printer may make a loud noise.

If Detect Page End is selected, intermittent printing does not occur before the image buffer length (300 mm) is reached.

However, compared to when selection is made, it may take longer to start printing.

➤ asb

This function sends automatic status every time the status of the printer changes.

➤ nsb

For USB (Printer Class) I/F, this function sends automatic status for each BULK IN transaction.

For wired LAN (Ethernet) I/F and wireless LAN I/F, this function sends automatic status when the print port (TCP #9100) is connected.

➤ mark_length_adjust

This function corrects the maximum length of a black mark that the sensor recognizes as a black mark. BM/GAP sensor detection error occurs when using black mark paper with black marks exceeding their specified length.

The initial value of the black mark length is 9 mm.

Set value of black mark length = 9 mm + (Corrected value of black mark length x 1 mm) (Correction range: 9 mm to 24 mm)

➤ horizontal_paper_saving

When enabled, Font-A (12 x 24 dots) is automatically replaced with Font-B (9 x 24 dots) to increase the number of characters per line.

➤ vertical_paper_saving

When enabled, the line space is reduced to 25% of the original size, the height of blank lines to 25%, the barcode height to 25%, and the height of the blank line immediately before the cut command to 0%.

If the line space is reduced to less than 2 dots (0.17 mm) by this setting, the line space is set to 2 dots.

If the barcode height is reduced to less than 45 dots (3.81 mm) by this setting, the barcode height is set to 45 dots.

This setting is disabled in page mode.

	Vertical paper saving: Disabled	Vertical paper saving: Enabled
Print result	Line spacing Approx. 0.67 mm (by command) Blank line Approx. 2.70 mm (by command) Barcode height Approx. 20 mm (by command) Blank line before cutting Approx. 2.70 mm (by command)	Line spacing Approx. 0.17 mm (25% of 0.67 mm) Blank line Approx. 0.68 mm (25% of 2.7 mm) Barcode height Approx. 5 mm (25% of 20 mm)

➤ special_region

When "thai" is set, Thai 1-path specification is supported. Additionally, a dedicated ANK font is selected, and the special baseline specification is adopted. Page mode, international character setting, slash 0 selection, and large fonts are disabled.

➤ international_character

This setting is disabled when Japanese kanji character is selected. International character setting is fixed to "japan".

➤ large_font

Large fonts are not compatible with all of the code page types. Accordingly, even if a large font has been selected, the selection may be possible with some code pages.

The following table shows the compatibility with large fonts by code page.

For the code pages that are not compatible with large fonts according to the table below, printing occurs in standard font even if large font is selected.

(✓: Large fonts compatible, -: Large fonts not compatible)

Code page	Compatibility with large fonts
Normal	✓
CodePage437 (USA,Std. Europe)	✓
Katakana	-
CodePage437 (USA,Std. Europe)	✓
Codepage 858 (Multilingual)	✓
Codepage 852 (Latin-2)	✓
Codepage 860 (Portuguese)	✓
Codepage 861 (Icelandic)	✓
Codepage 863 (Canadian French)	✓
Codepage 865 (Nordic)	✓
Codepage 866 (Cyrillic Russian)	✓
Codepage 855 (Cyrillic Bulgarian)	✓
Codepage 857 (Turkey)	✓
Codepage 862 (Israel (Hebrew))	-
Codepage 864 (Arabic)	-
Codepage 737 (Greek)	✓
Codepage 851 (Greek)	✓
Codepage 869 (Greek)	✓
Codepage 928 (Greek)	✓
Codepage 772 (Lithuanian)	✓
Codepage 774 (Lithuanian)	✓
Codepage 874 (Thai)	-
Codepage 1252 (Windows Latin-1)	✓
Codepage 1250 (Windows Latin-2)	✓
Codepage 1251 (Windows Cyrillic)	✓
Codepage 3840 (IBM-Russian)	✓
Codepage 3841 (Gost)	✓
Codepage 3843 (Polish)	✓
Codepage 3844 (CS2)	✓
Codepage 3845 (Hungarian)	✓
Codepage 3846 (Turkish)	✓
Codepage 3847 (Brazil-ABNT)	✓
Codepage 3848 (Brazil-ABICOMP)	✓
Codepage 1001 (Arabic)	-
Codepage 2001 (Lithuanian-KBL)	✓
Codepage 3001 (Estonian-1)	✓
Codepage 3002 (Estonian-2)	✓
Codepage 3011 (Latvian-1)	✓
Codepage 3012 (Latvian-2)	✓
Codepage 3021 (Bulgarian)	✓
Codepage 3041 (Maltese)	✓
Thai Character Code 42 (Thai)	-
Thai Character Code 11 (Thai)	-
Thai Character Code 13 (Thai)	-
Thai Character Code 18 (Thai)	-

➤ kanji_character_pitch

Character type	Value	Character size (Left Space + Font + Right Space)	Character size (When enlarging basic print size) (Left Space + Font + Right Space)
Japanese kanji	"standard"	26(1+24+1) dot	38(1+36+1) dot
Japanese kanji	"wide"	30(3+24+3) dot	44(4+36+4) dot
Chinese	"standard"	26(1+24+1) dot	38(1+36+1) dot
Chinese	"wide"	30(3+24+3) dot	44(4+36+4) dot

➤ ank_character_pitch

Character type	Value	Character size (Left Space + Font + Right Space)	Character size (When enlarging basic print size) (Left Space + Font + Right Space)
ANK (character_code = "none" or "shift_jis" or "japanese_ank")	"standard"	12(0+12+0) dot	18(0+18+0) dot
ANK (character_code = "none" or "shift_jis" or "japanese_ank")	"wide"	15(0+12+3) dot	22(0+18+4) dot
ANK (Other than the above)	"standard"	13(0+12+1) dot	19(0+18+1) dot
ANK (Other than the above)	"wide"	15(1+12+2) dot	22(1+18+3) dot
Single-byte Chinese characters	"standard"	13(0+12+1) dot	13(0+18+1) dot
Single-byte Chinese characters	"wide"	15(1+12+2) dot	15(1+18+3) dot

10. Related Regulations

10.1. Electrical safety / EMC

Country	Electrical safety	EMC
International	CB	-
EU	CE (EMI Class A)	
UK	UKCA (EMI Class A)	
USA	UL	FCC (EMI Class A)
Canada	cUL	ISED (EMI Class A)
Japan	-	VCCI (EMI Class A)
Australia / New Zealand	RCM (EMI Class A)	

10.2. Radio Law (Wireless Telegraphy Act) [Wireless model only]

Country	Radio wave
USA	FCC
Canada	ISED
EU	CE
UK	UKCA
Australia / New Zealand	RCM
Japan	Technical Standards Conformity Certification

10.3. Environment

Country	Environment
EU / UK	CE, UKCA (RoHS Directive) WEEE Directive Packaging and Package Waste Directive REACH Regulation
China	China RoHS
Taiwan	Taiwan RoHS

10.4. Energy star

International Energy Star Program compliant

11. Appendix

11.1. Example of ARP/Ping execution

Assumption: MAC address of printer = 00:11:62:12:34:56, Temporary IP address to set = 192.168.10.2

1. Turn the power ON.

Wait until the printer is ready to receive ARP/Ping (usually, about 25 seconds).

Alternatively, perform self-printing of the printer and wait until the following is printed:

```
*****
Current IP Parameters Status
*****
IP Address      :0.0.0.0 (Didn't obtain)
Subnet Mask     :0.0.0.0
Default Gateway :0.0.0.0
```

2. Execute the command prompt as an administrator to start up.
3. To avoid address duplication, clear the existing ARP table on the host device from the command line.

```
arp -d 192.168.10.2
arp -a
```

4. Register the combination of IP address and MAC address to the ARP table on the host device.

(Linux/Mac) Shell

```
arp -s 192.168.10.2 00:11:62:12:34:56
arp -a
```

(Windows) Command prompt

```
arp -s 192.168.10.2 00-11-62-12-34-56
arp -a
```

5. Run ping from the host device.

```
ping 192.168.10.2
```

6. Check that an echo response is returned from the NIC through the specified address.

Note that the initial echo response is not returned since it is used to retrieve the IP address.

Response is returned for the second ping and later.

```
ping 192.168.10.2
→ No response (timeout)
ping 192.168.10.2
→ echo response
ping 192.168.10.2
→ echo response
ping 192.168.10.2
→ echo response
```

7. Lastly, delete the ARP table registered in (4).

Be sure to carry out this operation to avoid address duplication.

```
arp -d 192.168.10.2
arp -a
```

11.2. Encryption suite support list

The following lists encryption suites supported by each service that uses SSL/TLS communication.

(✓: Supported, -: Not supported)

11.2.1. Star CloudPRNT

Service name		Star CloudPRNT			
Firmware version		1.0 and later			
TLS1.3		ENABLE(*)		DISABLE	
Encryption level setting of TLS1.2 encryption suite		HIGH + MEDIUM(*)	MEDIUM	HIGH + MEDIUM(*)	MEDIUM
Encryption suite name	TLS_AES_128_GCM_SHA256	✓	✓	-	-
	TLS_AES_256_GCM_SHA384	✓	✓	-	-
	TLS_CHACHA20_POLY1305_SHA256	✓	✓	-	-
	TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256	✓	-	✓	-
	TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384	✓	-	✓	-
	TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256	✓	-	✓	-
	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA	✓	-	✓	-
	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	✓	-	✓	-
	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA	✓	-	✓	-
	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384	✓	-	✓	-
	TLS_RSA_WITH_AES_128_GCM_SHA256	✓	-	✓	-
	TLS_RSA_WITH_AES_256_GCM_SHA384	✓	-	✓	-
	TLS_RSA_WITH_AES_128_CBC_SHA	✓	✓	✓	✓
	TLS_RSA_WITH_AES_128_CBC_SHA256	✓	-	✓	-
	TLS_RSA_WITH_AES_256_CBC_SHA	✓	✓	✓	✓
	TLS_RSA_WITH_AES_256_CBC_SHA256	✓	-	✓	-
	TLS_RSA_WITH_3DES_EDE_CBC_SHA	✓	✓	✓	✓
	TLS_RSA_WITH_RC4_128_SHA	✓	✓	✓	✓
	TLS_RSA_WITH_RC4_128_MD5	✓	✓	✓	✓

(*) Factory default setting

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