EPSON

ESC/Label

Application Development Guide

CW-C8000 Series

SEIKO EPSON CORPORATION

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1 Preface

1.1 Summary

This document explains the technical information necessary for using ESC/Label commands to develop printer control software (drivers, utilities, applications) for the CW-C8000 series. As this document does not explain the specifications for ESC/Label commands in detail, you must refer to the ESC/Label Command Reference Guide.

1.2 Scope of this document

This document applies to the development of printer control software for the CW-C8000 series using ESC/Label commands.

1.3 Reference materials

- ESC/Label Command Reference Guide

1.4 Using this document

This document is to be used as a reference for the design of user interfaces and the design of printer controls, for the functions that are recommended for inclusion in printer control software.

Refer to this document to consider which functions should be included in printer control software, according to the target market and users.

The UI samples and icons that appear in this document are included as examples of how users perform operations and the information that users want to know, but are not specifications about how printer control software should be implemented.

The usage cases that are described for each setting are intended to help users understand the settings, and should be used actively in the help functions and manuals for printer control software.

1.5 Definition of terms

The terms that are used in this document are defined as follows.

Table 1.5-1 List of terms

Term	**Description**
Printer control software	Refers to drivers, utilities, and applications, or a general term for such software.
Gap, gap between labels	For die-cut labels, refers to gaps between labels that are arranged on the backing sheet. The printer uses sensors to detect gaps between labels, in order to determine the optimum printing position for labels. The user can set it for full-page labels, too, within a certain range. Equivalent to gap between printable areas, which is the distance from the bottom of one printable area to the top of the next printable area.
Left gap	Refers to the distance from the left edge of the paper to the left edge of the printable area.
Right gap	Refers to the distance from the right edge of the printable area to the right edge of the paper.
Distance from the hole to the media edge	For tag papers, refers to the distance from the trailing edge of the hole for position detection to the top of the next printable area.
Black mark, BM	Refers to the black mark on the back of the label papers. The printer uses sensors to detect the black mark, in order to determine the optimum printing position for labels. Sometimes it is abbreviated as BM.
Hole	Refers to holes, long holes, or cut-outs of tag papers. The printer can determine the optimum printing position of tags according to sensor detection of holes and user settings.
Batch	Refers to printing multiple labels at one time.
Job	Refers to a group of multiple labels that the user prints at one time.
Format	Refers to a group of commands for printing labels, or an image that is rendered by that group of commands. A group of commands starts with ^XA and ends with ^XZ. A label format for printing includes at least one field.
Field	Refers to a group of commands for arranging objects, such as text, barcodes, images, and graphics, in a label format, and the images for each object that is rendered by that group of commands. A field whose content does not change within a batch is called a fixed field, and a field that changes is called a variable field.
Rendering canvas	Refers to the printer's internal memory for rendering images for printing label formats. One sheet of memory is reserved, and a field rendered, for each label format.
ICM	Abbreviation for Image Color Management
ICC	Abbreviation for International Color Consortium

2 Models

2.1 Model classification

The CW-C8000 series is classified into 2 ink types, namely, the gloss ink type and the matte ink type, depending on the black ink cartridge selected when the printer is first started up.

The printer control software determines the model by the product name in the device ID, and the ink type by the model information request command (~H(IMM). The product names are defined by region, and are listed in section 2.2 List of product names.

We recommend the following operation when the printer control software determines the ink type.

- Hold the ink type acquired from the printer in the printer control software.
- Apply the previous information if information cannot be acquired from the printer during printing. If previous information is not available, use the gloss ink type.

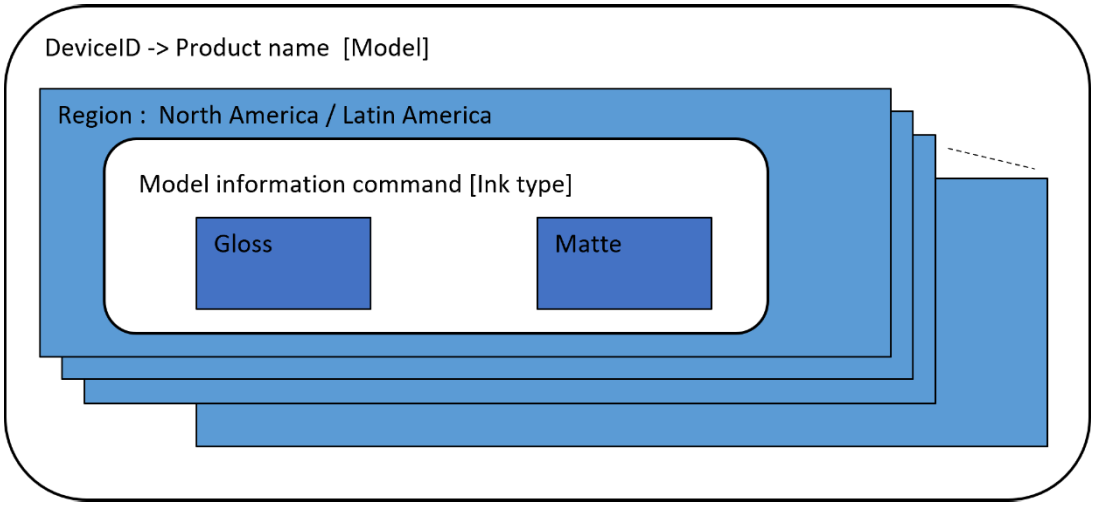


Figure 2.1-1 Models and ink types

2.2 List of product names

The product names are indicated.

Table 2.2-1 List of product names

Region	**Product Name**
North America / Latin America	CW-C8000u
Europe	CW-C8000e
Australia	CW-C8010
Japan	CW-C8020
China	CW-C8030
Korea	CW-C8040
Taiwan / Singapore / India	CW-C8050

3 Basic Printing Method

This chapter describes the basic command structure for printing labels.

3.1 Basic print command structure

The basic structure for commands that are transmitted when printing is shown below.

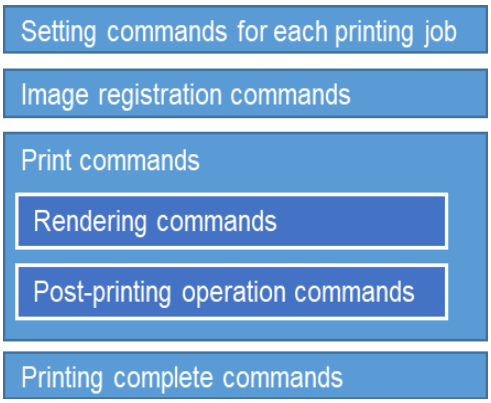


Figure 3.1-1 Basic print command structure

Table 3.1-1 Description of basic print command structure

Item	**Description**
Setting commands for each printing job	Insert the commands that perform the settings for each printing. • It is recommended to also delete any unnecessary files that remain in the printer during this step. • Specify the resolution before each setting.
Image registration commands	Register the image files to be used for printing.
Print commands	Insert commands related to printing and operation instructions for the printer.
Rendering commands	Insert the commands for rendering print data such as text, barcodes, and images.
Post-printing operation commands	Insert the commands for printer operations after printing, such as auto cut, buzzers, and pausing the printer.
Printing complete commands	Insert the commands for the next printing job after a printing job is complete. Delete the files that were registered for printing.

The print settings that should be transmitted for each printing job are described in Chapter 4 Print Settings. Methods for controlling more advanced printing jobs and post-printing operations are described in Chapter 5 Various Printing Methods.

3.2 Printing 1 label

3.2.1 Print target

The print target is shown below.



Figure 3.2.1-1 Sample label

The rendering components required for printing are shown below.

Table 3.2.1-1 Rendering components for sample label

Type	**Details**
Graphic Image	 BASEIMG.png
Text	"SCHOOL FEET"
Text	"Model :"
Text	"Serial No. :"
Graphic Image	ORIMG.png
Text	"90-22153"
Text	"00000001"
Text	"9"
Barcode	"0123456"

3.2.2 Command

Transmit commands as shown below, using the basic print command structure.

```
[Setting commands for each printing job]
^XA
^IDR:*.*^FS                          Delete files registered previously
^S(CLR,R,600                         Set format resolution to 600 [dpi]
^S(CLR,P,600                         Set print resolution to 600 [dpi]
^S(CLR,Z,600                         Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400           Set printable area to 101.6 [mm] x 101.6 [mm]
^S(CLS,C,71                          Set gap between printable area to 3 [mm]
^S(CLS,G,48                          Set left gap to 2 [mm]
^S(CLS,R,48                          Set right gap to 2 [mm]
^S(CLM,T,M1                          Set media coating type to Matte Paper
...                                  Other settings are omitted. Refer to Chapter 4 for details.
^XZ

[Image registration commands]
~DYR:BASEIMG,B,P,430267,0, .PNG...
~DYR:ORIMG,B,P,194,0, .PNG...

[Print commands]
^XA
<Rendering commands>                 Render images, text, and barcodes
^FO0,0^ILR:BASEIMG.PNG^FS
^FO1000,225^A0N,105,84^FDSCHOOL FEET^FS
^FO1000,445^A0N,105,84^FDModel :^FS
^FO1500,445^A0N,105,84^FD90-22153^FS
^FO1500,610^IMR:ORIMG.PNG^FS
^FO1000,785^A0N,105,84^FDSerial No. :^FS
^FO1500,785^A0N,105,84^FD00000001^FS
^FO1700,1020^A0N,150,120^FD9^FS
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS

<Post-printing operation commands>
^S(CUB,S,L                           Set post-printing buzzer
^XZ

[Printing complete commands]
^XA
^IDR:*.*^FS                          Delete image files that were registered for printing
^XZ
```

3.3 Printing multiple labels

3.3.1 Command structure

A command structure for a single batch that includes multiple labels is shown below.

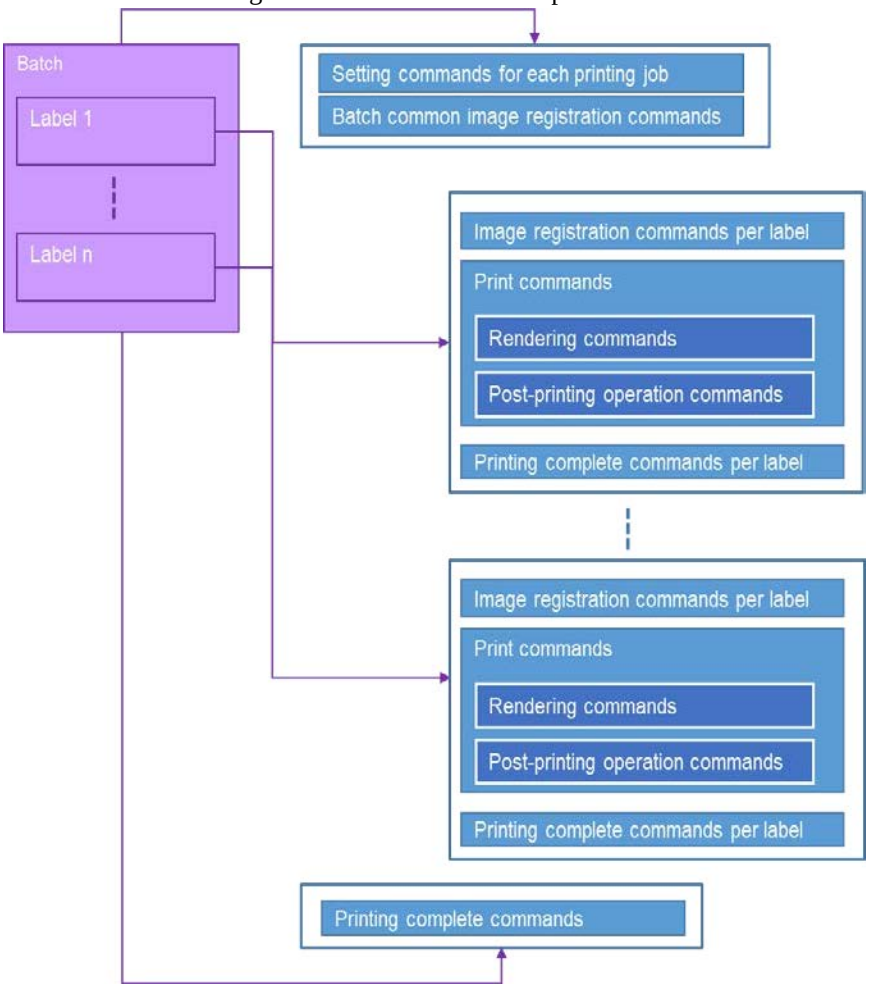


Figure 3.3.1-1 Command structure

- Common print settings and images are registered only once per batch.
- In order to prevent overflow of the printer's internal memory, register and delete the images for each label.
- Common images in a batch are deleted only once at the end of the batch.

3.3.2 Print target

The print target is shown below.



Figure 3.3.2-1 Sample label

The rendering components required for printing are shown below.

Table 3.3.2-1 Rendering components for sample label

Type	**Details**	
Graphic Image (Common)	BASEIMG.png	
Text	"SCHOOL FEET"	"SCHOOL FEET"
Text	"Model :"	"Model :"
Text	"Serial No. :"	"Serial No. :"
Graphic Image (Each Label)	ORIMG.png	GRIMG.png
Text	"90-22153"	"90-22153"
Text	"00000001"	"00000002"
Text	"9"	"9"
Barcode	"0123456"	"0123456"

3.3.3 Command

Configure the print settings and register the graphics that are common to a batch.

[Setting commands for each printing job]	
^XA	
^IDR:*.*^FS	Delete files registered previously
^S(CLR,R,600	Set format resolution to 600 [dpi]
^S(CLR,P,600	Set print resolution to 600 [dpi]
^S(CLR,Z,600	Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400	Set printable area to 101.6 [mm] x 101.6 [mm]
^S(CLS,C,71	Set gap between printable area to 3 [mm]
^S(CLS,G,48	Set left gap to 2 [mm]
^S(CLS,R,48	Set right gap to 2 [mm]
^S(CLM,T,M1	Set media coating type to Matte Paper
...	Other settings are omitted
^XZ	
[Image registration commands]	
~DYR:BASEIMG,B,P,430267,0, .PNG...	Register images that are common to the batch

Print the 1st label.

[Image registration commands]	
~DYR:ORIMG,B,P,194,0, .PNG...	Register image that is used only for the 1st label
[Print commands]	
^XA	
<Rendering commands>	Render images, text, and barcodes
^FO0,0^ILR:BASEIMG.PNG^FS	
^FO1000,225^A0N,105,84^FDSCHOOL FEET^FS	
^FO1000,445^A0N,105,84^FDModel :^FS	
^FO1500,445^A0N,105,84^FD90-22153^FS	
^FO1500,610^IMR:ORIMG.PNG^FS	Render image that is used only for the 1st label
^FO1000,785^A0N,105,84^FDSerial No. :^FS	
^FO1500,785^A0N,105,84^FD00000001^FS	Render serial number for the 1st label
^FO1700,1020^A0N,150,120^FD9^FS	
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS	
<Post-printing operation commands>	
^S(CUB,S,L	Set post-printing buzzer
^XZ	
[Printing complete commands]	
^XA	
^IDR:ORIMG.PNG^FS	Delete image file that is used only for the 1st label
^XZ	

Print the 2nd label.

[Image registration commands]	
~DYR:GRIMG,B,P,192,0, .PNG...	Register image that is used only for the 2nd label
[Print commands]	
^XA	
<Rendering commands>	Render images, text, and barcodes
^FO0,0^ILR:BASEIMG.PNG^FS	
^FO1000,225^A0N,105,84^FDSCHOOL FEET^FS	
^FO1000,445^A0N,105,84^FDModel :^FS	
^FO1500,445^A0N,105,84^FD90-22153^FS	
^FO1500,610^IMR:GRIMG.PNG^FS	Render image that is used only for the 2nd label
^FO1000,785^A0N,105,84^FDSerial No. :^FS	
^FO1500,785^A0N,105,84^FD00000002^FS	Render serial number for the 2nd label
^FO1700,1020^A0N,150,120^FD9^FS	
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS	
<Post-printing operation commands>	
^S(CUB,S,L	Set post-printing buzzer
^XZ	
[Printing complete commands]	
^XA	
^IDR:GRIMG.PNG^FS	Delete image file that is used only for the 2nd label
^XZ	

Perform the batch complete process.

[Printing complete commands]	
^XA	
^IDR:*.*^FS	Delete all image files that were used for printing
^XZ	

4 Print Settings

This chapter describes the functions and commands assumed to be configured each time the user performs printing.

The printer control software should allow the user to enter information easily, and it is recommended for the commands to be transmitted each time printing is performed.

Note that, if commands are not transmitted for each printing job, printing will be performed with the setting values that are saved in the printer.

The settings that can be configured in the printer are categorized in this document as print settings, described in this chapter, and printer settings, described in Chapter 6. Print settings are assumed to be changed by the user each time printing is performed, and printer settings are assumed to be changed by the user when changes are made to the way the printer is used, such as when replacing paper.

Examples are provided for how printer setting items are categorized, and the printer control software can define the categorization according to the system requirements. Categorization must observe the command transmission timing and setting storage policy for the printer, with the setting features shown in the table below.

Details that require particular attention are noted below.

- If the settings for items that are classified in this document as printer settings are changed while printing is in progress, unintended behavior may occur. If the printer control software implements a printer setting from this document as a print setting, the next print job must not be started while printing is in progress.
- The setting storage command (^JUS) can be sent to the printer to save settings in the printer control software and retain the settings even when the printer's power is turned off. However, the setting storage command cannot be sent to the printer for setting items that the printer control software implements as print settings. This is because there is a limit to the number of times that the printer's internal nonvolatile memory can be overwritten, and this could shorten the service life of the printer.
- Of the setting items that are categorized as print settings in this document, the settings for the control timing of buzzers, pausing the printer, and cutting cannot be stored in the printer, and therefore they cannot be used as printer settings.

Table 4-1 Setting features

Setting	**User requirements**	**Command transmission timing**	**Setting storage in printer (Using ^JUS)**
Print settings	Change settings for each print job	While printing	Prohibited
Printer settings	Change settings only when changing the way the printer is used	When idling	Allowed

4.1 List of print setting functions

A list of print setting functions is shown below.

Table 4.1-1 List of print setting functions

Category	**Function name**
Print settings	Media coating type setting
	Media layout setting
	Post-printing cut setting
	Post-printing buzzer setting
	Post-printing printer pause setting
	Ink profile level correction value setting
	Black ratio correction value setting
	Color correction type setting
	Manual color correction setting
	Banding reduction setting
	Edge correction setting
	Spot color adjustment setting
	Barcode width correction value setting
	Print speed setting
	Head maintenance setting
	Paper suction strength setting
	Distance between the head and the media setting

4.2 Print settings transmission method

As described in Chapter 3 Basic Printing Method, the commands for each setting item in this chapter are transmitted at the beginning of the command sequence for printing.

The command for setting resolution must be transmitted before any other. There is no particular transmission order stipulated for other commands.

If the printer control software does not support a particular setting item, the printer control software must not send a command related to that setting item. This is due to the fact that if the printer control software sends that command, the content that has been configured on the printer's panel or with the EPSON tool will no longer be applied to the print result.

An example of the transmission of commands is shown below.

[Setting commands for each printing job]	
^XA	
^IDR:*.*^FS	Delete files registered previously
^S(CLR,R,600	Set format resolution to 600 [dpi]
^S(CLR,P,600	Set print resolution to 600 [dpi]
^S(CLR,Z,600	Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400	Set printable area to 101.6 [mm] x 101.6 [mm]
^S(CLS,C,71	Set gap between printable area to 3 [mm]
^S(CLS,G,48	Set left gap to 2 [mm]
^S(CLS,R,48	Set right gap to 2 [mm]
^S(CLM,T,M1	Set media coating type to Matte Paper
^S(CMP,M,T	Set no cutting after printing
^S(CPC,D,0	Set ink profile level correction value to 0
^S(CPC,P,0	Set black ratio correction value to 0
^S(CPC,C,N	Set color correction type to Epson preferred color
^S(CPC,R,0	Set brightness to 0
^S(CPC,A,0	Set saturation to 0
^S(CPC,O,0	Set contrast to 0
^S(CPC,N,0	Set tone (cyan) to 0
^S(CPC,M,0	Set tone (magenta) to 0
^S(CPC,L,0	Set tone (yellow) to 0
^S(CPC,B,0	Set banding reduction to 0
^S(CPC,F,D	Set edge correction to disabled
^S(CPC,I	Set spot color list file to Not apply
^S(CBW,C,0	Set barcode width correction value to 0
^S(CMP,S,12	Set print speed to 300 [mm/s]
^S(CMP,F,1	Set head maintenance to Pause for maintenance (fine)
^S(CMF,S,E	Set paper suction strength setting method to manual
^S(CMF,M,10	Set paper suction strength to 10
^S(CMF,G,2	Set distance between the head and the media to 2
^XZ	

4.3 Media coating type and media layout settings

4.3.1 Media coating type setting

■ Function description:

- This function sets the media coating type to be used.
- The printer performs printing based on the media coating type that is set.
- If you do not set the correct media coating type, print quality may be reduced.
- Select the media coating type from the following.
  Plain Paper/Matte Paper/Synthetic/Texture Paper/Glossy Paper/Glossy Film/High Glossy Paper
  Default setting: Matte Paper
- Plain paper and texture paper are media coating types that only fit for the matte ink type, while glossy paper, glossy film, and high glossy paper are media coating types only fit for the gloss ink type. Matte paper and synthetic are media coating types fit for either of the ink types.

■ Usage case:

- Configure the setting according to the media that is loaded in the printer when printing.

■ Implementation recommendations:

- The printer control software can be made to allow the user to select any media coating type, regardless of the ink type. This is because Epson product User's Manuals list the media coating types fit for each ink type and recommend usage within that scope.

■ Command(s) used

- ^S(CLM,T

4.3.2 Media layout setting

■ Function description:

- This function sets the layout information for the media to be used.
- The printer determines the size and print position of the printable area based on the media layout information that has been set.
- If the correct media layout information is not set, media size errors may occur.

■ Usage case:

- Configure the setting according to the media that is loaded in the printer when printing.

■ Implementation recommendations:

- The user enters intuitive and easy-to-understand values according to the media detection method.
- If a media form other than tags is selected, the user enters a single setting so that the left and right gaps have the same value.
- If tags are selected as the media form, the values can be set for the left and right gaps individually. Also, the distance from the hole to the media edge can be set.
- Margins in the printable area are fixed to 0 in the printer. If the margin areas are set by the user, offsetting and clipping of the render position are performed by generating the print data in the printer control software, without changing the width and length of the printable area.
- The blue arrows and values that appear in the layout diagram are not entered by the user, but are displayed in the window for guidance.

■ Command(s) used

- ^S(CLS,L ^S(CLS,P ^S(CLS,C ^S(CLS,G ^S(CLS,R ^S(CLS,T

Definitions of printable areas, names of recommended user input items, and relationships with input content for label paper and continuous paper are shown below.

Table 4.3.2-1 Printable areas, user input items, and content

Definition of printable area	**Name of recommended user input item**	**Content of input**	
		Die-cut label	**Full-page label / Continuous paper**
Printable area width	Width	Width of label portion	Width of user image
Printable area length	Length	Length of label portion	Length of user image, or the value obtained by subtracting the gap between print areas from the gap between black marks
Gap between printable area	Gap between labels	Gap between labels	Length of longitudinal space that a user wishes to provide between prints
Left gap	Left&Right gap	Distance between backing sheet and label left edge	Distance between media left edge and user image left edge
Right gap			

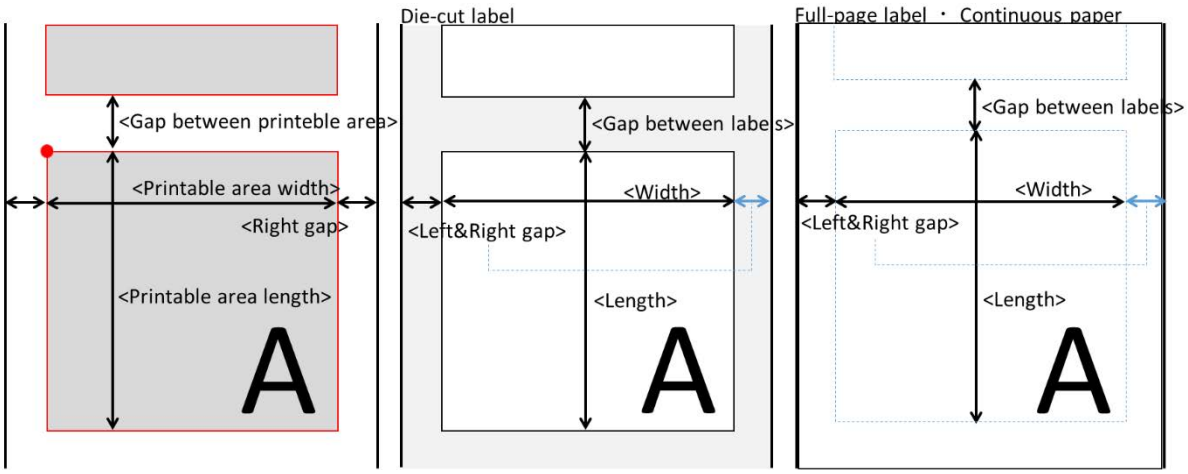


Figure 4.3.2-1 Media types of label paper and continuous paper

Definitions of printable areas, names of recommended user input items, and relationships with input content for tag paper are shown below.

Table 4.3.2-2 Printable areas of tag paper, user input items, and content

Definition of printable area	**Name of recommended user input item**	**Content of input**
Printable area width	Width	Width of user image
Printable area length	Length	Length of user image, or the value obtained by subtracting the gap between print areas from the gap between holes
Gap between printable area	Gap between labels	Length of longitudinal space that a user wishes to provide between prints
Left gap	Left gap	Distance between media left edge and user image left edge
Right gap	Right gap	Distance between user image right edge and media right edge
Distance from the hole to the media edge	Distance from the hole to the media edge	Distance between the trailing edge of the hole and the leading edge of the next user image

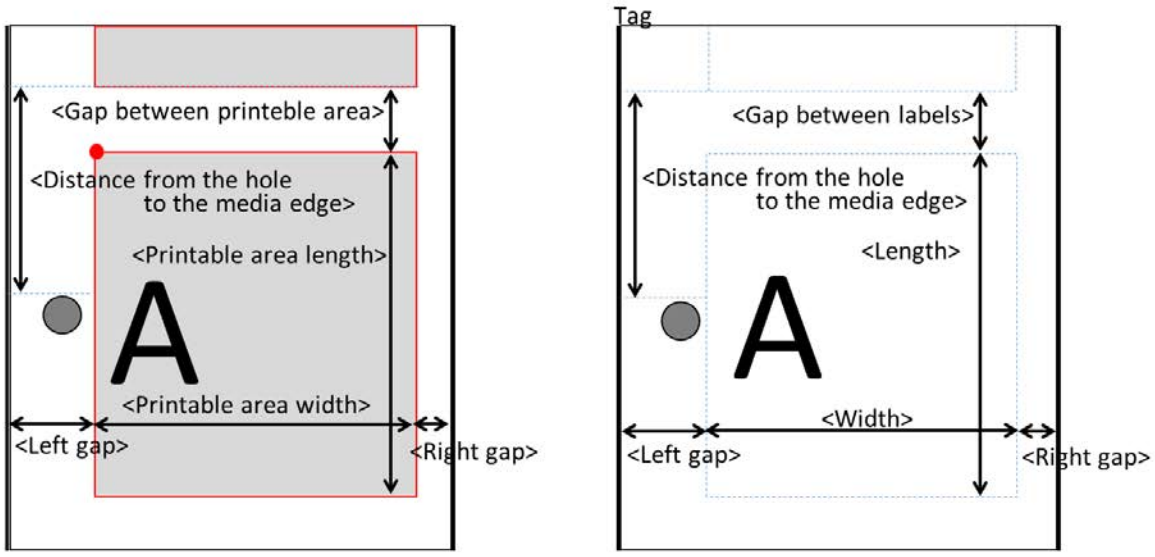


Figure 4.3.2-2 Media type of tag paper

- The die-cut label layout is shown below.

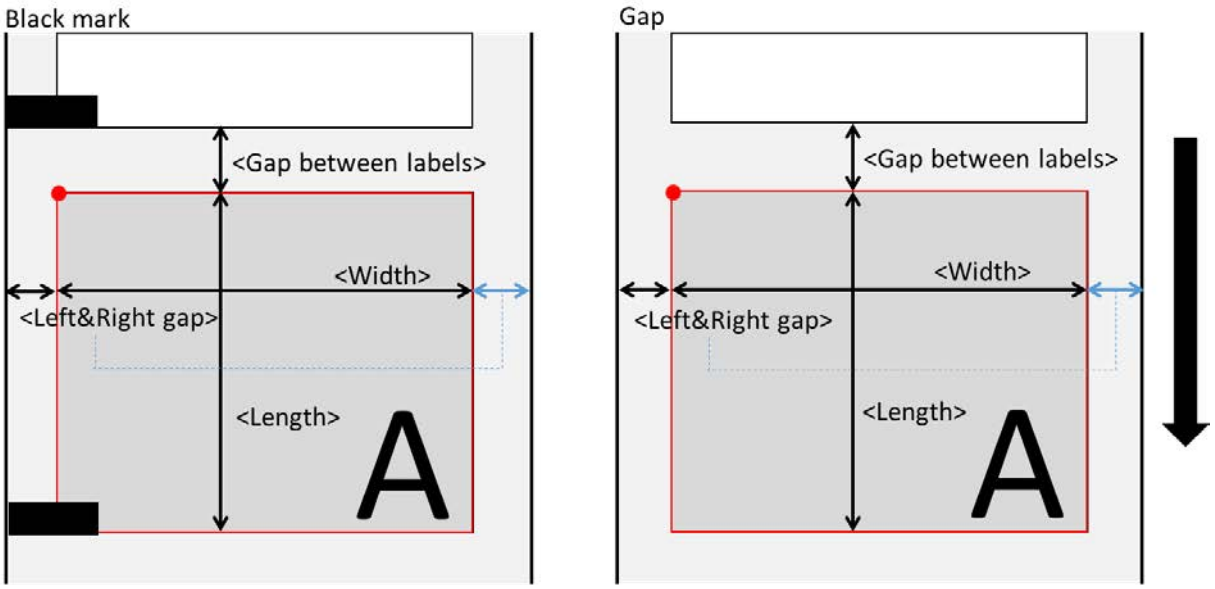


Figure 4.3.2-3 Die-cut label layout

Table 4.3.2-3 List of die-cut label setting values

Item	**Setting range**	**Recommended initial value**	**Command**
Width [mm]	21.4 to 112.0	108.0	^S(CLS,P
Length [mm]	8.0 to 1016.0	152.4	^S(CLS,L
Gap between labels [mm]	3.0 to 6.0	3.0	^S(CLS,C
Left&Right gap [mm]	0.0 to 6.0	2.0	^S(CLS,G ^S(CLS,R

- The full-page label layout is shown below.

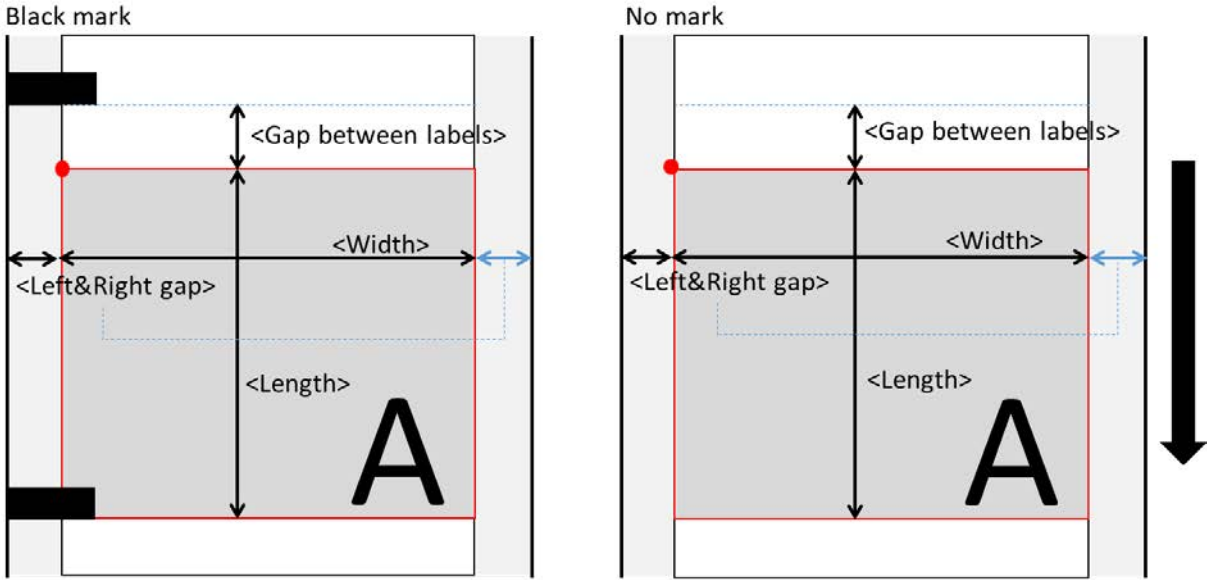


Figure 4.3.2-4 Full-page label layout

Table 4.3.2-4 List of full-page label setting values

Item	**Setting range**		**Recommended initial value**	**Command**
	Black mark	**No mark**		
Width [mm]	21.4 to 112.0	21.4 to 112.0	108.0	^S(CLS,P
Length [mm]	8.0 to 1016.0	11.0 to 1016.0	152.4	^S(CLS,L
Gap between labels [mm]	3.0 to 6.0	0.0 to 6.0 Less than 3.0 is not recommended	3.0	^S(CLS,C
Left&Right gap [mm]	0.0 to 6.0	0.0 to 6.0	2.0	^S(CLS,G ^S(CLS,R

For black mark detection, the command can be set with the value obtained by subtracting the gap between labels from the gap between black marks as the length, using the gap between black marks and gap between labels as user input.

Setting a gap between labels of less than 3 mm is not recommended. Refer to the limitations described later for details.

- The continuous paper layout is shown below.

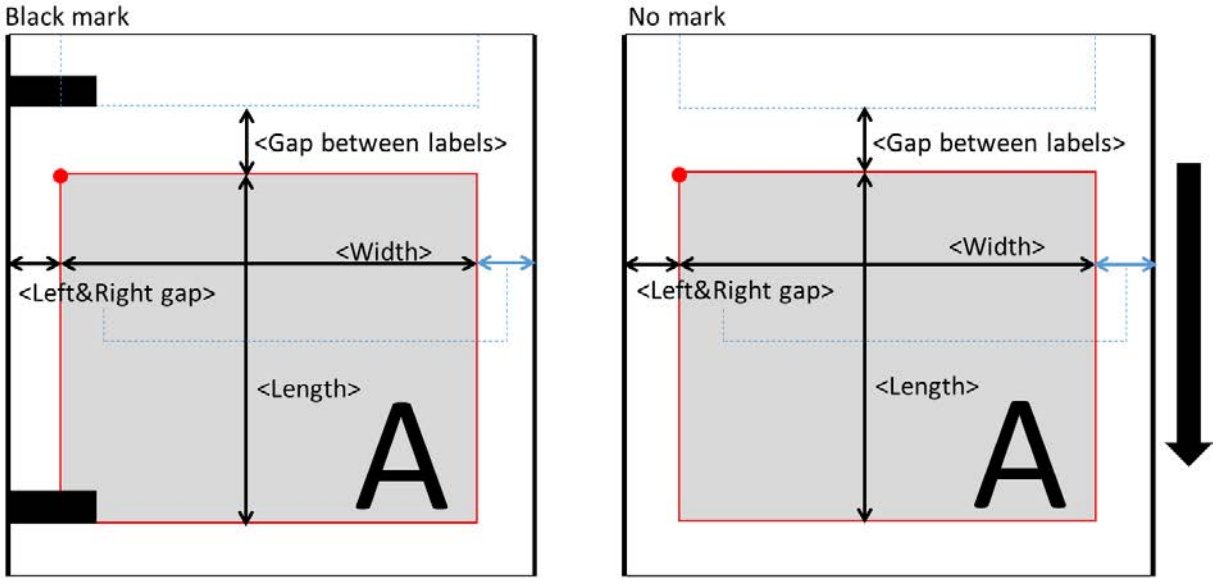


Figure 4.3.2-5 Continuous paper layout

Table 4.3.2-5 List of continuous paper setting values

Item	**Setting range**		**Recommended initial value**	**Command**
	Black mark	**No mark**		
Width [mm]	21.4 to 112.0	21.4 to 112.0	108.0	^S(CLS,P
Length [mm]	8.0 to 1016.0	11.0 to 1016.0	152.4	^S(CLS,L
Gap between labels [mm]	3.0 to 6.0	0.0 to 6.0 Less than 3.0 is not recommended	3.0	^S(CLS,C
Left&Right gap [mm]	0.0 to 6.0	0.0 to 6.0	2.0	^S(CLS,G ^S(CLS,R

Setting a gap between labels of less than 3 mm is not recommended. Refer to the limitations described later for details.

- The tag layout is shown below.

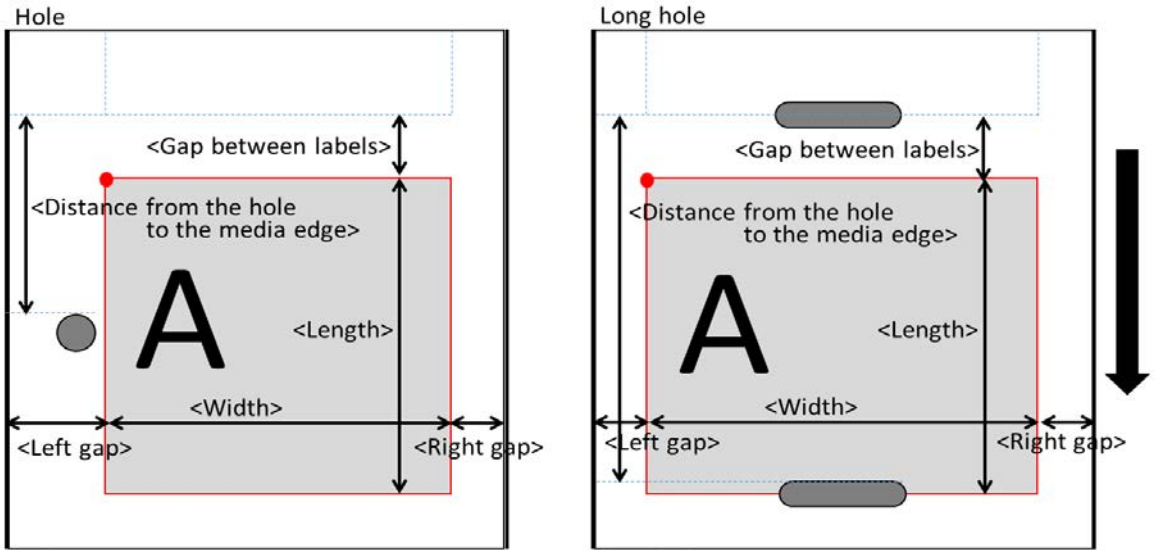


Figure 4.3.2-6 Tag layout

Table 4.3.2-6 List of tag setting values

Item	**Setting range**	**Recommended initial value**	**Command**
Width [mm]	21.4 to 112.0	76.2	^S(CLS,P
Length [mm]	8.0 to 300.0	50.8	^S(CLS,L
Gap between labels [mm]	3.0 to 6.0	3.0	^S(CLS,C
Left gap [mm]	0.0 to 30.0	12.0	^S(CLS,G
Right gap [mm]	0.0 to 30.0	2.0	^S(CLS,R
Distance from the hole to the media edge [mm]	0.0 to 306.0	28.4	^S(CLS,T

- The limitations if the gap between labels is set to less than 3 mm are shown below.
  - If the gap between labels is set to less than 3 mm, both the gap between labels and the length are rounded down to the nearest 32-dot unit at a conversion of 1200 dpi.

    For this reason, there will be a maximum difference of approximately 0.7 mm in the set gap between the labels and distance between prints, and between the set length and print length, respectively.
  - If enabling the printer control software to set a gap between labels of less than 3 mm, it is recommended to inform the user that the distance between prints and print length will change, and of those values.

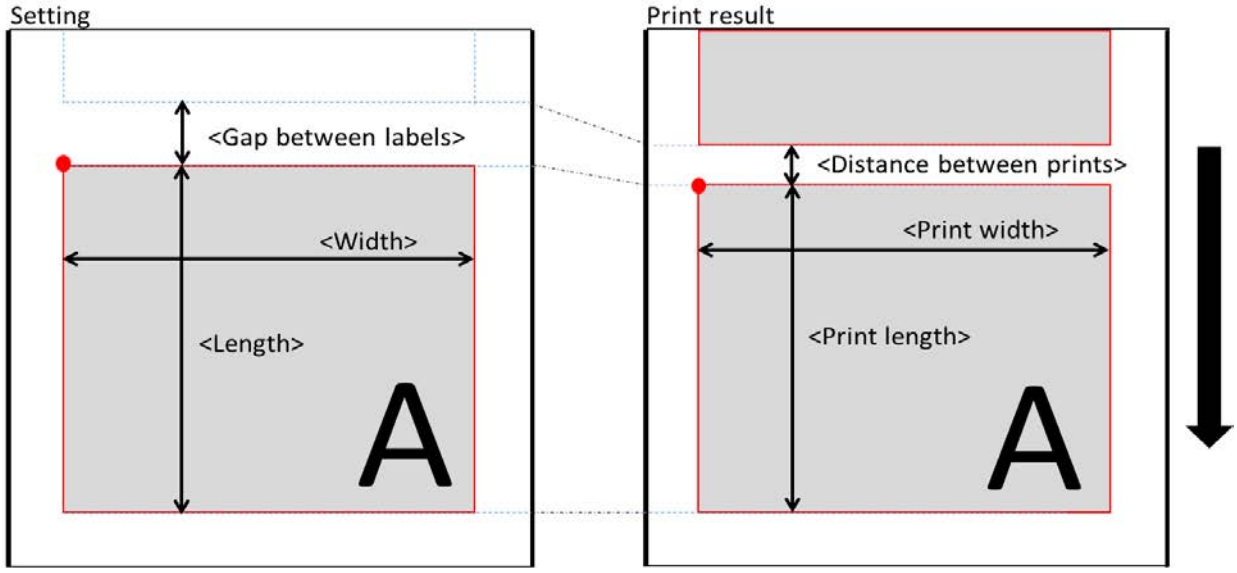


Figure 4.3.2-7 Setting and print result of a gap between labels of less than 3 mm

4.4 Post-printing operation settings

This chapter shows examples of user settings for post-printing operations, including commands to use. The print settings are used to set the availability of cutting after printing, as well as stop positions.

Refer to “Chapter 5.3 Controlling buzzers, pausing, and cutting” for information on how to control buzzers, pausing of the printer, and cutting at the timing set by the user.

4.4.1 Cut setting

■ Function description:

- Use this function to set operations after printing (optimum stop position for an operation) and the auto cut timing.
- Select the operation setting from the following.

Table 4.4.1-1 List of post-printing operation settings

Item	**Description**
Cut	Performs an auto cut at the timing that has been set.
Do not cut (stop at cut position)	The user presses the cut button to perform cutting as necessary.
Do not cut (stop at specified stop position)	Cutting is not performed, and stops at the user specified stop position.

- If the post-printing operation setting is set to "Cut", auto cut is possible while printing by using the ^PQ command. The following timings are recommended for performing an auto cut.

Table 4.4.1-2 List of auto cut timings

Item	**Description**
Each specified label	Cuts after each user-specified number of labels.
After printing last label of collated printing	Cuts after the last label of collated printing is printed.
After printing last label	Cuts after the last label of a batch is printed.

■ Usage case:

- Use to set the cutting method after printing.

■ Command(s) used:

- ^S(CMP,M ^PQ

4.4.2 Buzzer setting

■ Function description:

- Use this function to sound the buzzer on the printer at the timing after printing that is specified by the user.
- The following timings are recommended for sounding the buzzer.

Table 4.4.2-1 List of buzzer timings

Item	**Description**
Do not sound	The buzzer is not sounded after printing.
After printing last label	The buzzer is sounded after the last label of a batch is printed.

■ Usage case:

- Use this function to sound a buzzer when the number of units specified by the user have been printed.

■ Command(s) used:

- ^S(CUB,S

4.4.3 Printer pause setting

■ Function description:

- Use this function to pause the printer at the timing after printing that is specified by the user.
- The following timings are recommended for pausing the printer.

Table 4.4.3-1 List of printer pause timings

Item	**Description**
Do not pause	The printer does not pause after printing.
After cutting	The printer is paused in connection with the cut setting.
Each specified label	The printer is paused after each user-specified number of labels.
After printing last label	The printer is paused after the last label of a batch is printed.

■ Usage case:

- Use when the user must perform some action after printing, such as checking the printed media or removing paper that has been cut.

■ Command(s) used:

- ^PQ

4.5 Image quality setting

The degree of the effect of the settings described in this chapter may vary depending on the media that is used. It is recommended to inform the user to check the results of the print settings on the media that will actually be used.

4.5.1 Ink profile level correction value setting

■ Function description:

- Use this function to set the correction value for the standard ink profile level.
- When this setting is changed, the ink profile amount (volume of ink used) changes.
- Using the default setting as the standard, you can set 3 grades toward light and 10 grades toward dark (for a total of 14 grades).

  Default setting: 0

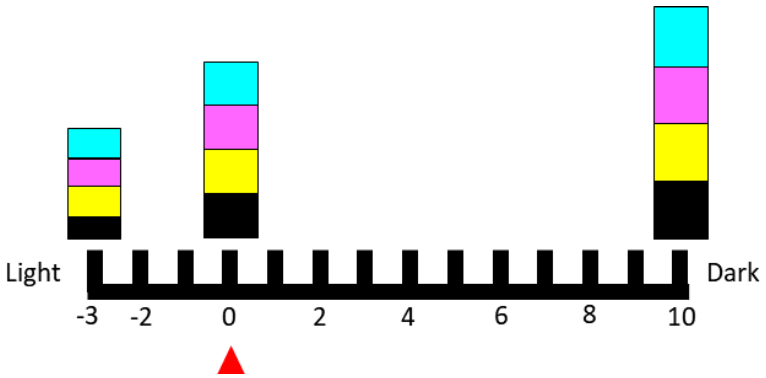


Figure 4.5.1-1 Ink profile amount

■ Usage case:

- Use to reduce or increase the volume of ink used according to the media coating type and the content that is printed.

■ Implementation recommendations:

- When the ink profile level is changed, the barcode scanning quality may drop. In addition, if the grade is changed toward dark, print quality may reduce in regard to bleeding, transfer, abrasion resistance, and water resistance. Inform the user of the risk of reduced barcode scanning quality and reduced image quality if the ink profile level is changed.

■ Command(s) used:

- ^S(CPC,D

4.5.2 Black ratio correction value setting

■ Function description:

- Use this function to set the correction value for the ink ratio that makes up the color black.
- If this setting value is changed, the ratio of ink that is used when printing black will change.
- Using the default setting as the standard, you can set 6 grades for a lower ratio of black ink.
  Default setting: 0

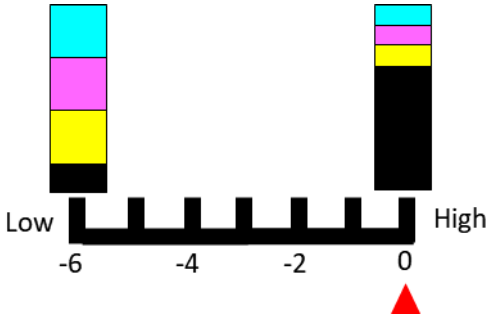


Figure 4.5.2-1 Black ratio correction

■ Usage case:

- Lower the blank ink ratio when you check the printed media and find that the ink can easily peel off.

  Depending on the quality of the media, black ink can easily peel off when printing with the default black ratio correction value. If this occurs, correct the value.

■ Implementation recommendations:

- When the black ratio correction value is changed, the barcode scanning quality may drop and there is a risk of a reduction in black density. Inform the user of the risk of reduced barcode scanning quality and reduced image quality if the black ratio correction value is changed.
- When the media coating type is changed, return the black ratio correction value to the default setting.

■ Command(s) used:

- ^S(CPC,P

4.5.3 Color correction type setting

■ Function description:

- Use this function to set the method of correcting printed colors according to the content to be printed.
- Use the type of color correction that is set for this function to correct colors in order to achieve the best printing results with the printer.
- Select from the following methods of correction.

  Epson preferred color/Epson standard color/Epson vivid color/ICM/None

  Default setting: Epson preferred color
- If you select Epson preferred color, Epson standard color, or Epson vivid color, you can use the manual color correction described later in this document.
- You can select ICM if printing using ICM (described later in this document) is supported by the printer control software. Refer to "Chapter 5.4 Printing using ICM" for details about printing using ICM.

■ Usage case:

- Use to set an optimum type of color correction according to the content to be printed.

■ Command(s) used:

- ^S(CPC,C

The types of color correction and their command parameters are shown below.

For ICM, specify the command parameter D: None.

Table 4.5.3-1 Types of color correction and their command parameters

Item	**Description**	**Command parameter**
Epson preferred color	Performs color correction that tries to match the coloring of the output device with that of the display, based on a design concept conforming to sRGB space.	N: Epson preferred color
EPSON standard color	Performs printing with the sRGB space color unchanged and no correction applied to the image.	E: EPSON standard color
Epson vivid color	Performs sharp color correction in an sRGB space.	V: Epson vivid color
ICM	Uses the printer control software to perform color correction, in order to match the colors of the output device with the colors on the display.	D: None
None	Color correction has already been performed with the application used to create the image, and is not performed by either the printer control software or the printer.	D: None

4.5.4 Manual color correction setting

■ Function description:

- Use this function to set more detailed color correction.
- The printer corrects the colors of an image based on the setting values.
- Manual color correction is not performed if the type of color correction is set to ICM or None.

Table 4.5.4-1 Correction content

Item	**Description**
Brightness	Adjust the brightness of the entire image.
Saturation	Adjust the vividness of the image.
Contrast	Adjust the difference between the light and dark areas of the image.
Tone (cyan)	Adjust the strength of red and cyan.
Tone (magenta)	Adjust the strength of green and magenta.
Tone (yellow)	Adjust the strength of blue and yellow.

■ Usage case:

- Use if the application that was used to create the image has no color correction function.

■ Implementation recommendations:

- Manual color correction is possible only if the type of color correction is set to Epson preferred color, Epson standard color, or Epson vivid color.

  The printer control software displays the settings window for manual color correction and allows the values to be changed only when the type of color correction is set to Epson preferred color, Epson standard color, or Epson vivid color.

  When the type of color correction is set to ICM or no color correction, either the settings window for manual color correction is not displayed or the values cannot be changed.

Table 4.5.4-2 Types of color correction and manual color correction

Type of color correction	**Manual color correction**
Epson preferred color	✓
Epson standard color	✓
Epson vivid color	✓
ICM	N/A
None	N/A

- If the user changes the type of color correction from a type that supports manual color correction to a type that does not support it, the printer control software stores the settings for manual color correction so that they can be displayed again the next time the supporting type is selected.

■ Command(s) used:

- ^S(CPC,R ^S(CPC,A ^S(CPC,O ^S(CPC,N ^S(CPC,M ^S(CPC,L

The setting items and their commands are shown below.

Table 4.5.4-3 List of manual color correction setting values

Item	Setting range	Default setting	Command
Brightness	-25 to +25	0	^S(CPC,R
Saturation	-25 to +25	0	^S(CPC,A
Contrast	-25 to +25	0	^S(CPC,O
Tone (cyan)	-25 to +25	0	^S(CPC,N
Tone (magenta)	-25 to +25	0	^S(CPC,M
Tone (yellow)	-25 to +25	0	^S(CPC,L

For ICM or None, the commands for manual color correction are not sent. Examples of these commands are shown below.

Example 1: When the type of color correction is set to Epson vivid color

^XA	
^S(CPC,C,V	Set color correction type to Epson vivid color
^S(CPC,R,0	Set brightness to 0
^S(CPC,A,0	Set saturation to 0
^S(CPC,O,0	Set contrast to 0
^S(CPC,N,0	Set tone (cyan) to 0
^S(CPC,M,0	Set tone (magenta) to 0
^S(CPC,L,0	Set tone (yellow) to 0
^XZ	

Example 2: When the type of color correction is set to ICM or None

^XA	
^S(CPC,C,D	Set color correction type to None
	Manual color correction commands not sent
^XZ	

4.5.5 Banding reduction setting

■ Function description:
- Use this function to set the correction value for reducing vertical banded color irregularities that occur in the print result.
- Using the default setting as the standard, you can set 3 grades toward light and 7 grades toward dark (for a total of 11 grades).

  Default setting: 0

■ Usage case:
- If there are banded color irregularities darker than the surrounding area due to the media coating type being used, set this towards light.
- If there are banded color irregularities lighter than the surrounding area, set this towards dark.

■ Command(s) used:
- ^S(CPC,B

4.5.6 Edge correction setting

■ Function description:
- Use this function to reduce the problem of visible gaps between background and black text due to misalignment of ink droplets between ink colors.
- You can set it to enabled or disabled.

  Default setting: Disabled
- Enable correction to increase the ink profile for the edge part and thicken the lines.

■ Usage case:
- Set to enabled if there is a noticeable gap created between background and text due to the print content.

■ Command(s) used:
- ^S(CPC,F

4.5.7 Spot color adjustment setting

■ Function description:

- Use this function to set specific colors in an image to colors designated by the user for printing.

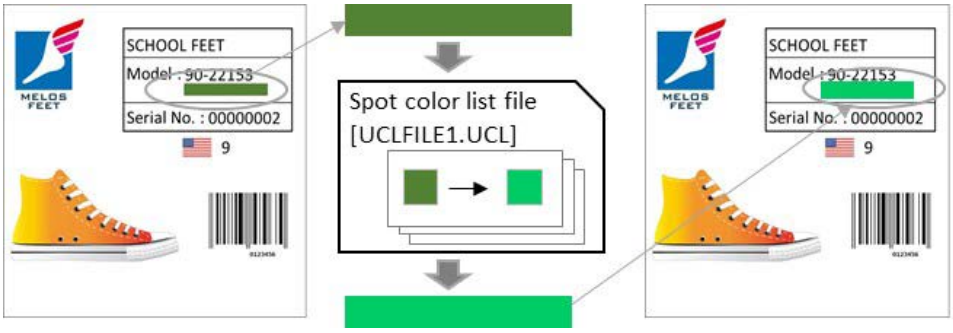


Figure 4.5.7-1 Spot color adjustment

- The user uses the EPSON tool to create in advance a spot color list file that contains color conversion information.
- The user selects whether to apply spot color adjustment and the target spot color list file on the printer control software when printing.
- The printer control software sends a spot color list file to be applied to the printer with each printing and enables the file.
- The printer converts a specific color according to the enabled spot color list file and prints it.

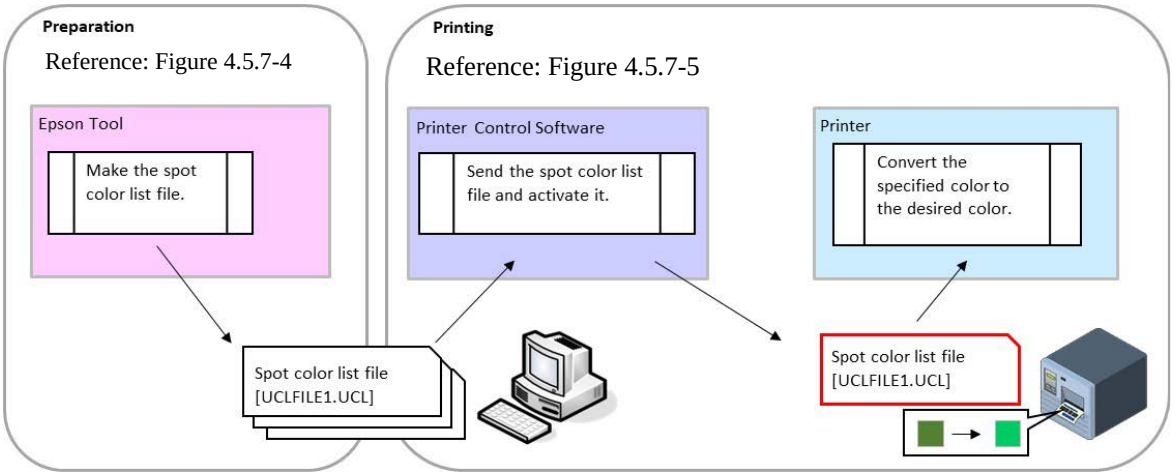


Figure 4.5.7-2 Outline flow of the Spot color adjustment

■ Usage case:

- Use this function for components that you particularly want to print with an appropriate color, such as logos or other symbols.

■ Implementation recommendations:

- When printing with spot color adjustments, the printer control software should display a note that recommending that the user use the same image quality setting as when creating a spot color list file. If the image quality settings are different, the color designated as the spot color may not be reproduced correctly. The related image quality settings are as follows:
  - Ink profile level correction value setting
  - Black ratio correction value setting
  - Color correction type setting
  - Manual color correction setting
- The printer control software should display a note recommending that users not use spot color adjustments with ICM. That is because the color specified as a spot color may change in ICM.

■ Command(s) used:

- ~DY ^ID ^S(CPC,I

The items and UI samples that the user sets when printing are shown below.

Table 4.5.7-1 User setting items

Item		**Description**
Not apply		Choose this when not applying spot color adjustment with this print.
Apply		Choose this when applying spot color adjustment with this print.
	Spot color list file name (Open file)	From the spot color list files that the user saved on the computer with the EPSON tool in advance, specify the one to this printing. • The default folder displayed in the dialog when selecting a spot color list file is shown below. This is also the default location where the EPSON tool saves the file. • We recommend a user interface that allows users to easily specify the information that was previously specified. <Default folder> [Public documents]\EPSON\SpotColorData\CW-C8000 Series * [Public document] is a path that can be obtained by specifying CSIDL_COMMON_DOCUMENTS in Windows API, etc.

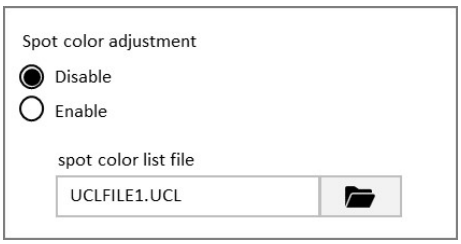


Figure 4.5.7-3 UI sample for applying a spot color list file

The method for transmitting commands is shown below.

If a spot color list file is not applied, the printer control software sends only the spot color list file selection command (^S(CPC, I). In this case, the file name in the command parameter is left blank.

If a spot color list file is applied, the printer control software sends the spot color list file selected by the user using the file registration command (~DY). Next, the printer control software sends a spot color list file selection command (^S(CPC, I). The spot color list file name is specified as the command parameter file name. The printer control software deletes the spot color list file using the file deletion command (^ID) after printing.

Note that the maximum file name length that can be set in the command parameter is 8 characters, so the printer control software limits the file name length to 8 characters or less and specifies it in the command parameter.

Examples of these commands are shown below.

Example 1: Not applying a spot color list file

[Setting commands for each printing job]	
^XA^S(CPC,I^XZ	Set spot color list file to Not apply

Example 2: Applying the spot color list file "UCLFILE1.UCL"

[Spot color list file registration command]	
~DYR:UCLFILE1.UCL,B,UCL,820,0,...	Register spot color list file
[Setting commands for each printing job]	
^XA^S(CPC,I, R:UCLFILE1.UCL^XZ	Set to apply spot color list file
Other commands required for printing are omitted. See Chapter 3 for details.	
[Printing complete commands]	
^XA^IDR:*.*^FS^XZ	Delete image files and spot color list files registered for printing

Detailed flows of the overall system for spot color adjustment are shown below.

1) The flow of creating a spot color list file is shown here. Although the user does not use the printer control software to create the spot color list file, this is provided as reference information.

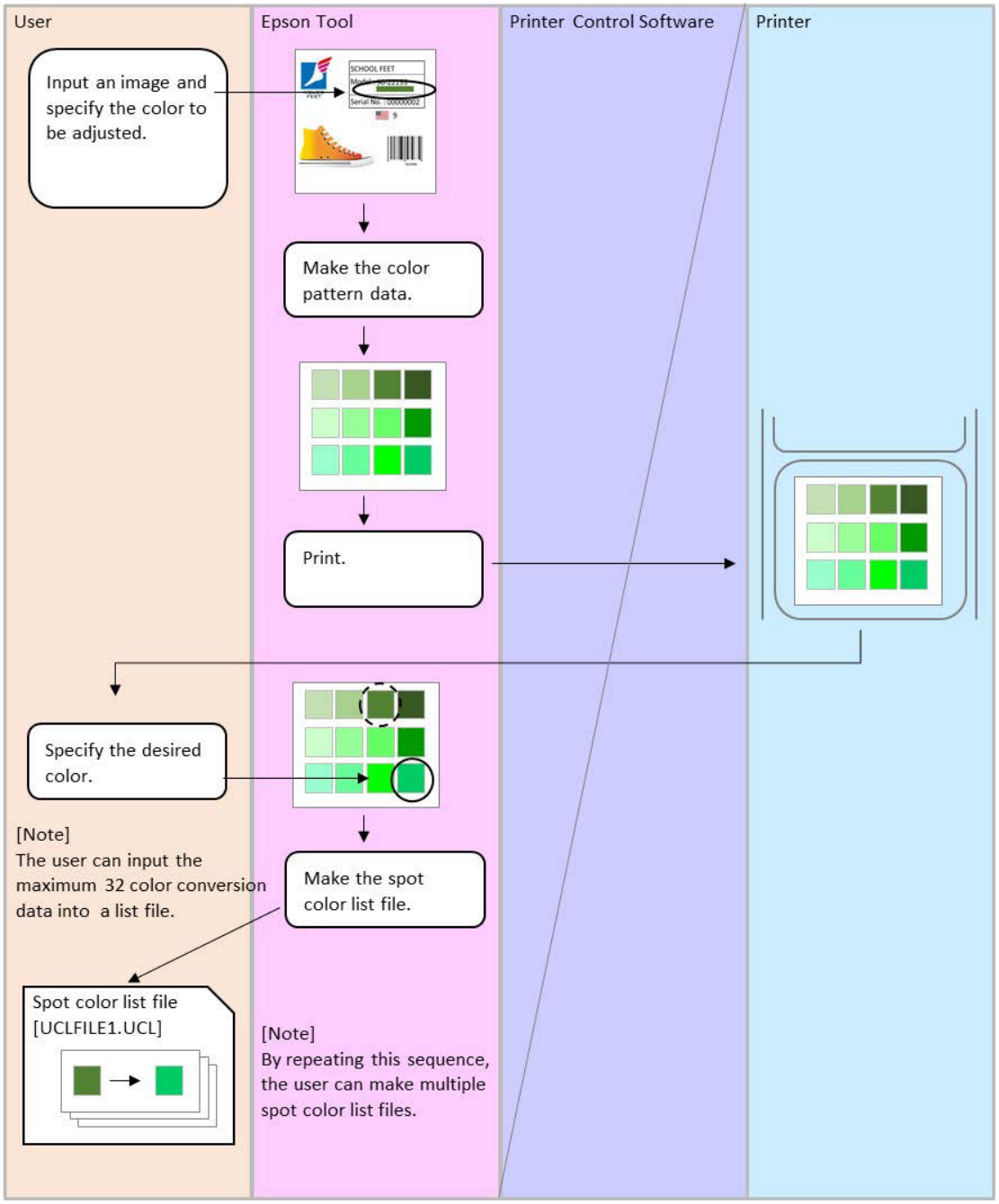


Figure 4.5.7-4 Creating a spot color list file

2) This shows the flow of printing when applying spot colors.

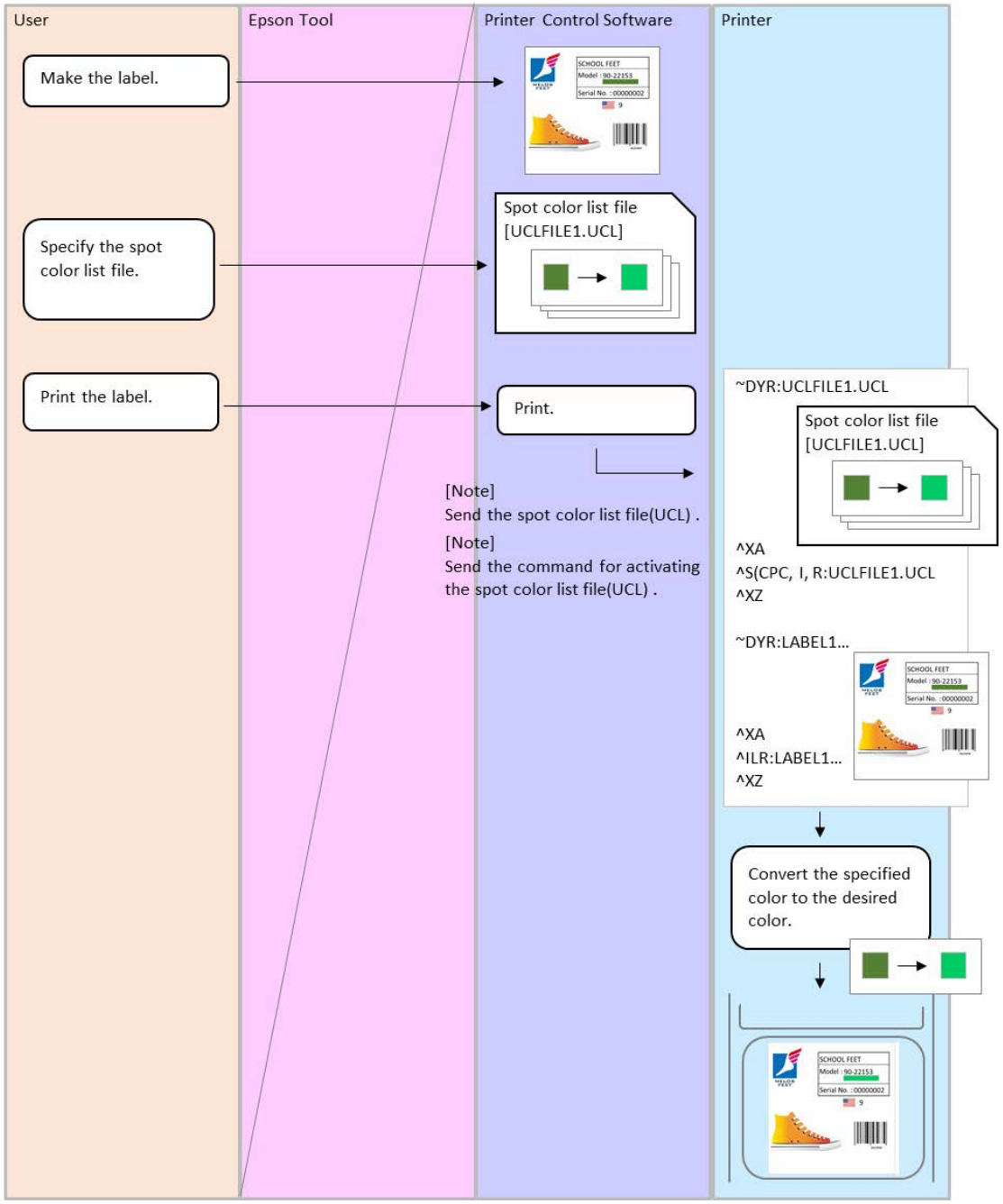


Figure 4.5.7-5 Printing with applied spot colors

4.5.8 Barcode width correction value setting

■ Function description:

- Use this function to set the bar width correction value for barcodes.
- Using the default setting as the standard, you can set 2 grades toward narrowing the bar width and set it 2 grades toward widening (for a total of 5 grades).

  Default setting: 0
- If you change this setting, the bar width will change when barcodes are printed.
  - By correcting the bar width of barcodes, you can prevent reduced barcode scanning quality due to ink bleeding.
  - Target barcodes

    UPC-A, UPC-E, JAN13(EAN), JAN8(EAN), Code39, ITF, Codabar, Code93, Code128, GS1-128, GS1 DataBar Truncated, GS1 DataBar Expanded, GS1 DataBar Limited, PDF417, Micro PDF, GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Expanded Stacked, QR Code, Micro QR, Aztec, DataMatrix
  - If the bar width adjustment is changed by 1 step, the bar width changes by 1 dot at a conversion of 600 dpi.

    For 300 dpi, a 2-step change makes a change of 1 dot.
  - Even with the default conditions, corrections are made to improve the barcode scanning quality. When the adjustment value is set to the default setting (0), the bar width is narrowed by 2 dots, at a conversion of 600 dpi in comparison with the width calculated using the standards for each symbol. For 300 dpi, it is narrowed by 1 dot.

■ Usage case:

- Check the scanning of printed barcodes, and use this function if the scanning quality is low.

■ Implementation recommendations:

- Inform the user of the risk that the barcode scanning quality might drop paradoxically if the barcode width correction value is changed.

■ Command(s) used:

- ^S(CBW,C

4.5.9 Print speed setting

■ Function description:

- Use this function to set the print speed.
- Select one of the following print speed settings.

  300 [mm/s]/150 [mm/s]

  Default setting: 300 [mm/s]

■ Usage case:

- Set the print speed slower if processing of an external device connected to the printer is hindered.
- Printing stops midway during a batch and backfeed is performed to continue printing if data transfer is not completed in time due to print content. In this case, set the print speed slower.

■ Command(s) used:

- ^S(CMP,S

4.5.10 Head maintenance setting

■ Function description:

- Use this function to set execution priority for either print throughput or print quality.
- Select one of the following head maintenance settings.

Table 4.5.10-1 Head maintenance settings

Head maintenance setting	**Mode**
Continuous printing (fast)	Flush onto paper mode: Level 2
Pause for maintenance (fine)	Flush onto paper mode: Level 1

Default setting: Pause for maintenance (fine)

- Setting to “Continuous printing” decreases the print quality and increases the throughput when printing multiple labels.
- Setting to “Continuous printing” results in a noticeably excess amount of ink being discharged on the print surface.
- Flush onto paper mode:

  The higher the level of flush onto paper mode, the greater the amount of ink discharged, thereby reducing the print quality. However, you can expect the throughput to improve if printing multiple labels because discharging a large amount of ink allows you to increase the time until the periodic flushing that retracts the head and discharges ink is performed.

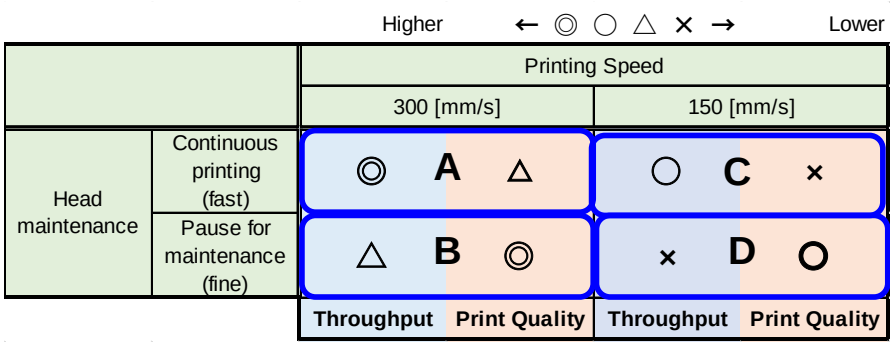
■ Usage case:

- Set if you want to change the priority of throughput and image quality

■ Command(s) used:

- ^S(CMP,F

Table 4.5.10-2 Selection of print throughput and speed



Pattern A [Recommended]: Select to assign priority to print throughput.

Pattern B [Recommended]: Select to assign priority to print quality.

Pattern C: Select if there is an issue in connecting with an external device.

(The operation speed of an external device does not satisfy the print speed and Pause for maintenance is not permitted.)

Pattern D: Select if there is an issue connecting with an external device.

(The operation speed of an external device does not satisfy the print speed and degradation of print quality is not permitted.)

4.5.11 Paper suction strength setting

■ Function description:

- Use this function to set the paper suction strength.
- Select one of the following setting methods for paper suction strength.

Table 4.5.11-1 Setting method for paper suction strength

Item	**Description**
Auto	The printer configures the setting automatically.
Manual	The user configures the setting manually.

Default setting: Auto

- When set to Auto, the printer uses a suction strength based on settings such as media coating type to hold the paper to the platen.
- When set to Manual, the printer uses the paper suction strength set by the user to hold the paper to the platen.
- For Manual, you can set the level for paper suction strength to a value from 1 to 10, in increments of 1.

  Default setting: 10

■ Usage case:

- When using the recommended media, the printer uses an appropriate suction strength with the Auto setting. However, use the Manual setting to set an appropriate suction strength when using a variety of different paper.
- When using thin and soft paper, the suction strength might be set too high. If printing is not affected but you want to reduce noise, lower the paper suction strength setting.
- When using thick and hard paper, the suction strength might be set too low, causing friction with the head. In this case, increase the setting for paper suction strength.

■ Command(s) used:

- ^S(CMF,S ^S(CMF,M

4.5.12 Distance between the head and the media setting

■ Function description:

- Use this function to set the distance between the head and paper according to the paper thickness.
- Using the default setting as the standard, you can set 1 grade toward narrowing the distance and 2 grades toward widening (for a total of 4 grades).

  Default setting: 2

■ Usage case:

- Set a narrower distance between the head and paper if there are noticeable ripple marks or using thin paper.
- Set a wider distance between the head and paper if using thick paper.

■ Command(s) used:

- ^S(CMF,G

5 Various Printing Methods

This chapter describes a variety of printing methods using settings and commands.

5.1 Selecting an input resolution

Due to the fast print speed of the CW-C8000 series, rendering processing of the printer control software or the printer might not be fast enough to match the print speed. In such cases, continuous printing will frequently stop. Although the default input resolution of the CW-C8000 series is 600 dpi, the input resolution can be changed to 300 dpi in order to avoid the above-indicated occurrence. The printer control software is recommended to allow the user to select the rendering resolution from two types: 600 dpi and 300 dpi. The default is 600 dpi because the image quality may be reduced at 300 dpi in comparison with 600 dpi, so the user must be informed to select 300 dpi if there are issues with continuous printing.

Table 5.1-1 Input resolution

Input resolution [dpi]	**Selection standard**
600	Default
300	Select if continuous printing stops when using 600 dpi. The print quality may be reduced in comparison with 600 dpi.

An example using an input resolution of 600 dpi was shown in Chapter 3. The information provided here is for an input resolution of 300 dpi.

- Set each resolution to 300 dpi in the print settings. Be sure to configure this setting before any other. The resolutions that must be set are the format resolution, the print resolution, and the printer resolution before replacement.
- Set images that are registered in the printer to 300 dpi.
- Set the position and size for the print command to values suitable for 300 dpi.

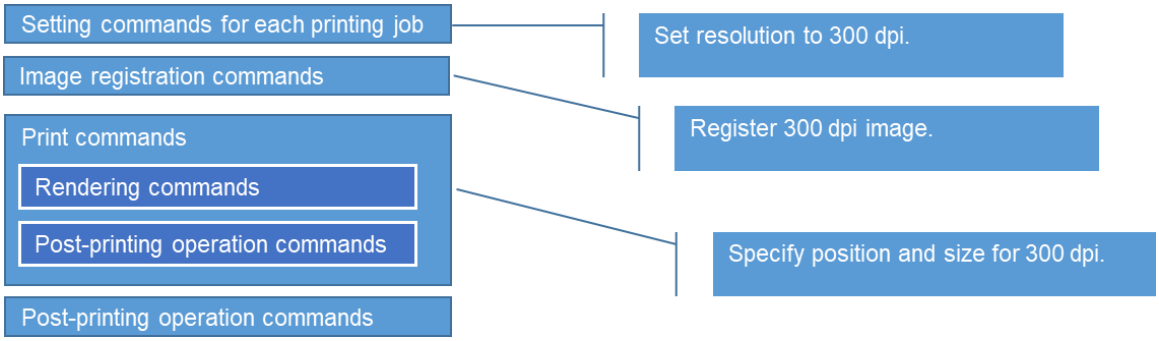


Figure 5.1-1 Command structure for an input resolution of 300 dpi

5.1.1 Print target

The print target is shown below. Prepare images of 300 dpi in advance.



Figure 5.1.1-1 Sample label

The rendering components required for printing are shown below.

Table 5.1.1-1 Rendering components for sample label

Type	**Details**
Graphic Image	 BASEIMG2.png
Text	"SCHOOL FEET"
Text	"Model :"
Text	"Serial No. :"
Graphic Image	ORIMG.png
Text	"90-22153"
Text	"00000001"
Text	"9"
Barcode	"0123456"

5.1.2 Command

```
[Setting commands for each printing job]
^XA
^IDR:*.*^FS
^S(CLR,R,300                          Set format resolution to 300 [dpi]
^S(CLR,P,300                          Set print resolution to 300 [dpi]
^S(CLR,Z,300                          Set printer resolution before replacement to 300 [dpi]
^S(CLS,P,1200^S(CLS,L,1200            Set printable area at 300 [dpi]
^S(CLS,C,35                           Set gap between printable area at 300 [dpi]
^S(CLS,G,24                           Set left gap at 300 [dpi]
^S(CLS,R,24                           Set right gap at 300 [dpi]
^S(CLM,T,M1                           Set media coating type to Matte Paper
...                                   Other settings are omitted.
^XZ

[Image registration commands]
~DYR:BASEIMG,B,P,95318,0, .PNG...
~DYR:ORIMG,B,P,162,0, .PNG...

[Print commands]
^XA
<Rendering commands>                  Specify object position and size for 300 [dpi]
^FO0,0^ILR:BASEIMG.PNG^FS
^FO500,112^A0N,60,48^FDSCHOOL FEET^FS
^FO500,222^A0N,60,48^FDModel :^FS
^FO750,222^A0N,60,48^FD90-22153^FS
^FO750,305^IMR:ORIMG.PNG^FS
^FO500,393^A0N,60,48^FDSerial No. :^FS
^FO750,392^A0N,60,48^FD00000001^FS
^FO850,510^A0N,90,72^FD9^FS
^FO750,650^BY4,3^B8N,150,Y,N^FD0123456^FS

<Post-printing operation commands>
^S(CUB,S,L
^XZ

[Printing complete commands]
^XA
^IDR:*.*^FS
^XZ
```

5.2 Efficiently printing multiple labels

The printer renders objects such as text, barcodes, images, and graphics in each field of the rendering canvas according to the commands that are transmitted. If there are many fields on a single label, the rendering time will be longer and it will take longer for printing to start.

If there are multiple labels in a single batch, there might be a wait time between printing the first and second labels, because the second and subsequent labels are rendered in the same way as the first. This chapter describes a printing method for reducing the rendering time for the second and subsequent labels, when a single batch includes multiple labels.

We recommend including this function in cases where many labels are printed at once, so that the total print time does not become longer than expected.

5.2.1 Operating principle

Common fields for the first label and each subsequent label are rendered first, and they are saved as a template image. For both the first and subsequent labels, the template image that was saved is rendered first, and then only the fields that are different for each label are rendered.

If there are many fields to render and there is a high ratio of common fields between multiple labels, you can expect an improvement in the rendering speed.

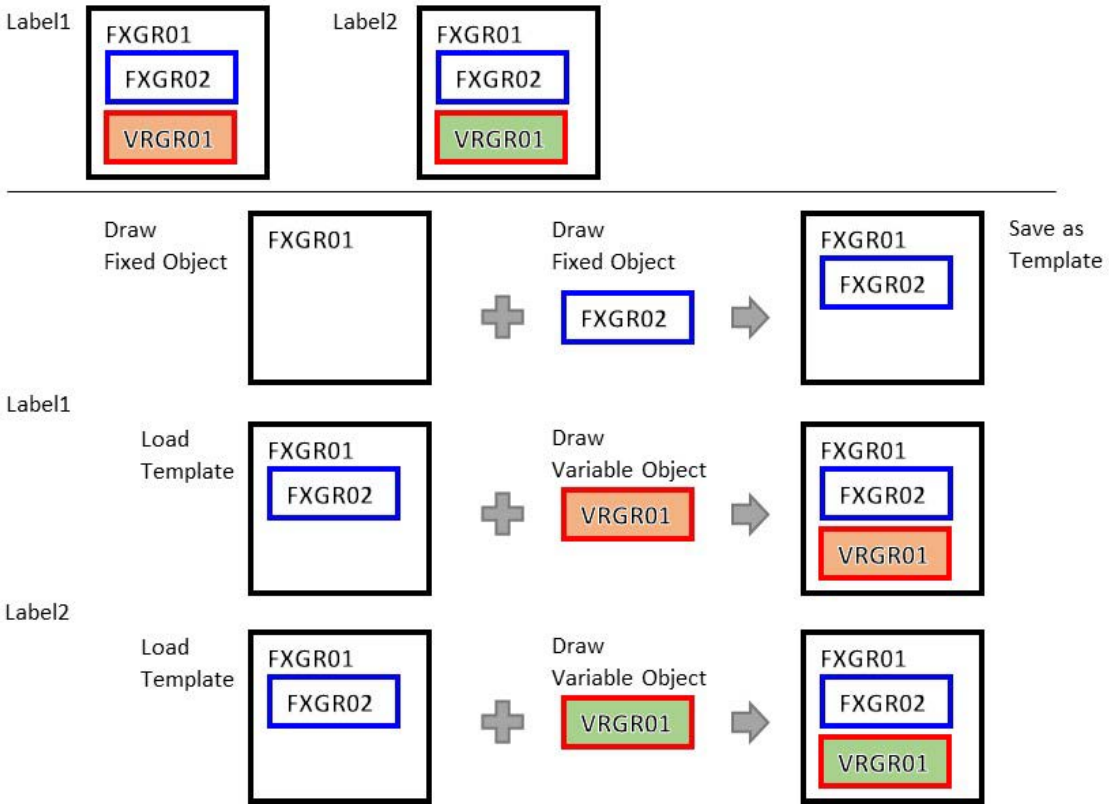


Figure 5.2.1-1 Operating principle

5.2.2 Command structure

The command structure for achieving the operating principle described above is shown below.

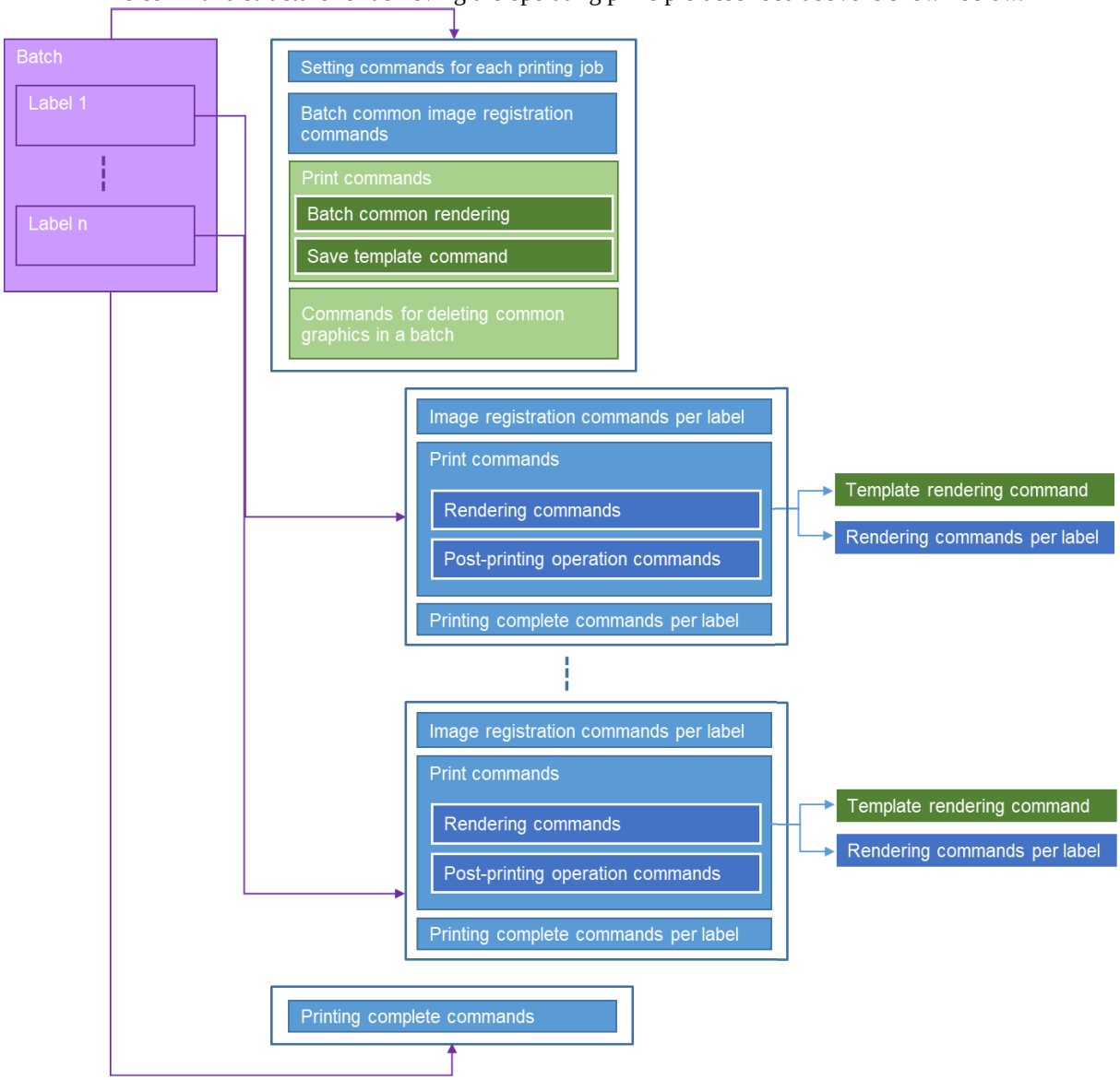


Figure 5.2.2-1 Command structure

5.2.3 Print target

The print target is shown below. Each of the field names are shown in Label 1.



Label 1 Label 2

Figure 5.2.3-1 Sample label

The rendering components required for printing are shown below.

Table 5.2.3-1 Rendering components for sample label

Attribute	**Field name**	**Type**	**Details**	
Fixed	FXGR01	Graphic Image (Common)	BASEIMG.png	
	FXTX01	Text	"SCHOOL FEET"	"SCHOOL FEET"
	FXTX02	Text	"Model :"	"Model :"
	FXTX03	Text	"Serial No. :"	"Serial No. :"
Variable	VRGR01	Graphic Image (Each Label)	ORIMG.png	GRIMG.png
	VRTX01	Text	"90-22153"	"90-22153"
	VRTX02	Text	"00000001"	"00000002"
	VRTX03	Text	"9"	"9"
	VRBC01	Barcode	"0123456"	"0123456"

5.2.4 Command

Configure the print settings and register the graphics that are common to a batch.
Transmit the discard command ^C(D for the rendering canvas as the last setting for each print job.

[Setting commands for each printing job]	
^XA	
^IDR:*.*^FS	Delete files registered previously
^S(CLR,R,600	Set format resolution to 600 [dpi]
^S(CLR,P,600	Set print resolution to 600 [dpi]
^S(CLR,Z,600	Set printer resolution before replacement to 600 [dpi]
^S(CLS,P,2400^S(CLS,L,2400	Set printable area to 101.6 [mm] x 101.6 [mm]
^S(CLS,C,71	Set gap between printable area to 3 [mm]
^S(CLS,G,48	Set left gap to 2 [mm]
^S(CLS,R,48	Set right gap to 2 [mm]
^S(CLM,T,M1	Set media coating type to Matte Paper
...	Other settings are omitted.
^C(D	Discard rendering canvas
^XZ	
[Image registration commands]	
~DYR:BASEIMG,B,P,430267,0, .PNG...	Register images that are common to the batch

Create images and save the template.

Render only the fixed fields, and transmit the temporary save command ^C(S for the rendering canvas before the end of the format. For the parameter for the temporary save command for the rendering canvas, set no printing after saving.

[Print commands]	
^XA	
<Rendering commands>	Render fixed fields
^FO0,0^ILR:BASEIMG.PNG^FS	FXGR01
^FO1000,225^A0N,105,84^FDSCHOOL FEET^FS	FXTX01
^FO1000,445^A0N,105,84^FDModel :^FS	FXTX02
^FO1000,785^A0N,105,84^FDSerial No. :^FS	FXTX03
<Saving template commands>	
^C(SN	Save rendering canvas (no printing)
^XZ	
[Commands for deleting common graphics in a batch]	
^XA	
^IDR:BASEIMG.PNG^FS	Delete image files used to render fixed fields
^XZ	

The template image that is saved is shown below.



Figure 5.2.4-1 Template image

Print the 1st label.

Use the render command to load and render the render canvas that was saved with the render canvas load command ^C(L.

[Image registration commands]	
~DYR:ORIMG,B,P,194,0, .PNG...	Register image that is used only for the 1st label
[Print commands]	
^XA	
<Rendering commands>	
^C(L	Load rendering canvas (All fixed fields are rendered.)
^FO1500,445^A0N,105,84^FD90-22153^FS	Render variable fields
^FO1500,610^IMR:ORIMG.PNG^FS	
^FO1500,785^A0N,105,84^FD00000001^FS	
^FO1700,1020^A0N,150,120^FD9^FS	
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS	
<Post-printing operation commands>	
^S(CUB,S,L	Set post-printing buzzer
^XZ	
[Printing complete commands]	
^XA	
^IDR:ORIMG.PNG^FS	Delete image file that is used only for the 1st label
^XZ	

Print the 2nd label.

[Image registration commands]	
~DYR:GRIMG,B,P,192,0, .PNG...	Register image that is used only for the 2nd label
[Print commands]	
^XA	
<Rendering commands>	
^C(L	Load rendering canvas (All fixed fields are rendered.)
^FO1500,445^A0N,105,84^FD90-22153^FS	Render variable fields
^FO1500,610^IMR:GRIMG.PNG^FS	
^FO1500,785^A0N,105,84^FD00000002^FS	
^FO1700,1020^A0N,150,120^FD9^FS	
^FO1500,1300^BY7,3^B8N,300,Y,N^FD0123456^FS	
<Post-printing operation commands>	
^S(CUB,S,L	Set post-printing buzzer
^XZ	
[Printing complete commands]	
^XA	
^IDR:GRIMG.PNG^FS	Delete image file that is used only for the 2nd label
^XZ	

Perform the batch complete process.

[Printing complete commands]	
^XA	
^IDR:*.*^FS	Delete all image files that were used for printing
^XZ	

With these command examples, fixed images are loaded for every label format for each label, and the variable fields are rendered. These definitions can be saved in a format file, and the format file can be loaded at the beginning of a label format.

In addition, if there are no variable graphics in the label format, the sequential number commands ^SN, ^SF can be used to print multiple labels.

Fixed areas and variable areas can be user-defined. However, it is possible to further improve the effect by using the printer control software to detect changes in the content of a field and then create a template image in the corresponding batch.

5.3 Controlling buzzers, pausing, and cutting

This section describes the control method for instructing the printer to sound a buzzer, make a cut, or pause after the desired label is printed.

Send an instruction for the buzzer each time a label is printed (^XA-^XZ).

Send an instruction to pause the printer by using the ^PQ command or the ^PP command each time a label is printed (^XA-^XZ).

^PQ Pause printer each time the specified number of labels is printed

^PP Pause printer after the last label is printed

For cutting, use the ^S(C command to set the printer to make a cut. The last label will always be cut. However, use the ^PQ command to set the cut timing when selecting whether to make a cut after each page.

Examples of command parameters are shown below.

Table 5.3-1 Examples of command parameters for each function

Function	**Command example**	**Description**
Buzzer	^S(CUB,S,N	Printer does not sound buzzer.
	^S(CUB,S,L	Printer sounds buzzer after printing last label.
Pause	^PQ1	Printer prints one label and does not pause.
	^PQ1,1	Printer prints one label and pauses after printing one label.
	^PQ3,1	Printer prints three labels and pauses after printing one label.
	^PQ3,3	Printer prints three labels and pauses after printing three labels.
	^PP	Printer prints one label and pauses after printing one label.
	^PQ3^PP	Printer prints three labels and pauses after printing three labels.
Cut	^S(CMP,M,T ^S(CMP,M,P	Printer does not make a cut.
	^S(CMP,M,C	Printer always makes a cut after the last label.
		Use in combination with ^PQ to make cuts other than after the last label.

5.3.1 Buzzer

■ Function

Buzzer timing setting

■ Command code

^S(CUB,S,c

■ Parameters

c = N: Printer does not sound buzzer

L: Printer sounds buzzer after printing last label

This command is used to set how the printer's buzzer operates.

To change the volume of the buzzer, use the controls on the printer's panel or the ^S(CUB,Z command.

Example 1: Printing three labels, and sounding a buzzer after printing the last label

```
^XA
^S(CUB,S,L                          Set printer to sound buzzer after printing last label
^FO0,0^FDprint 3 pages^FS
^PQ3
^XZ
```

Example 2: Printing three labels without sounding a buzzer

```
^XA
^S(CUB,S,N                          Set printer to not sound buzzer
^FO0,0^FDprint 3 pages^FS
^PQ3
^XZ
```

Example 3: Printing two labels, and sounding a buzzer after printing the last label

When specifying whether to sound a buzzer for each ^XA-^XZ, transmit the following commands.

```
^XA
^S(CUB,S,N
^FO0,0^FDprint 1 page(1 of 2)^FS
^XZ

^XA
^S(CUB,S,L
^FO0,0^FDprint 1 page(2 of 2)^FS
^XZ
```

5.3.2 Pause

[^PP command]

■ Function

Pause

■ Command code

^PP

This command is used to pause the printer after printing the last label.

Example 1: Printing three labels and pausing the printer, repeated three times

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 1 of 3 ^FS ^PQ3 ^PP ^XZ	Print three labels and pause
^XA^FO100,100^FD 2 of 3 ^FS ^PQ3 ^PP ^XZ	Print three labels and pause
^XA^FO100,100^FD 3 of 3 ^FS ^PQ3 ^PP ^XZ	Print three labels and pause

[^PQ command]

■ Function

Number of labels printed setting

■ Command code

^PQ t, i, c, p

■ Parameters

t = 1 or more	Total number of labels printed
i = 0 or more	Number of labels printed between pausing or cutting operations
c = 0 or more	Number of labels printed with serial numbers
p = Y or N	Set/cancel pause suppression

Example 1: Using the i parameter of the ^PQ command to pause after every three labels are printed

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 1 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 2 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 3 of 9 ^FS ^PQ1,1 ^XZ	Print labels and pause
^XA^FO100,100^FD 4 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 5 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 6 of 9 ^FS ^PQ1,1 ^XZ	Print labels and pause
^XA^FO100,100^FD 7 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 8 of 9 ^FS ^PQ1,0 ^XZ	
^XA^FO100,100^FD 9 of 9 ^FS ^PQ1,1 ^XZ	Print labels and pause

Example 2: Printing three labels and pausing the printer, repeated three times

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 1 of 3 ^FS ^PQ3,3 ^XZ	Print three labels and pause
^XA^FO100,100^FD 2 of 3 ^FS ^PQ3,3 ^XZ	Print three labels and pause
^XA^FO100,100^FD 3 of 3 ^FS ^PQ3,3 ^XZ	Print three labels and pause

Example 3: Printing nine labels, pausing after every three labels are printed

^XA^S(CMP,M,T^XZ	Set printer to not make a cut
^XA^FO100,100^FD 9 pages ^FS ^PQ9,3 ^XZ	Print three labels and pause

5.3.3 Cut

■ Function

Post-printing operation settings

■ Command code

S(CMP,M,c

■ Parameters

c =	T	Do not cut (stop at cut position)
	P	Do not cut (stop at peel-off position)
	C	Cut

For the CW-C8000 series, use Parameter P: Do not cut (stop at peel-off position) to stop at the specified position without cutting being performed.

Labels are cut at the following timing only if cutting is set to be performed after printing.

- Timing specified for parameter i of the ^PQ command
- When printing of the last label is complete

Example 1: Printing and cutting one label

^XA	
^S(CMP,M,C	Set printer to make a cut
^FO100,100^FD 1 of 1^FS	Set printer to print a label
^XZ	

Example 2: Printing three labels, cutting and pausing after each label

^XA	
^S(CMP,M,C	Set printer to make a cut
^FO100,100^FD 3 pages^FS	
^PQ3,1	Set printer to print three labels, cutting and pausing after each label
^XZ	

Example 3: Printing three labels, cutting but not pausing after each label

^XA	
^S(CMP,M,C	Set printer to make a cut
^FO100,100^FD 3 pages^FS	
^PQ3,1,,Y	Set printer to print three labels, cutting but not pausing after each label
^XZ	

5.3.4 Examples of combinations of cutting and pausing

This section shows examples of commands for cutting labels and pausing the printer according to the operations in the following table.

Table 5.3.4-1 Cutting and pausing operations for command examples

Operation timing	**Cut**	**Pause**
After printing third label	Yes	Yes
After printing sixth label	No	Yes
After printing ninth label	Yes	No
After printing other label	No	No

Example 1: Specifying cutting and pausing after printing one label for each ^XA-^XZ

^XA^S(CMP,M,T^FO100,100^FD 1 of 9 ^FS ^PQ1,0 ^XZ	
^XA^S(CMP,M,T^FO100,100^FD 2 of 9 ^FS ^PQ1,0 ^XZ	
^XA^S(CMP,M,C^FO100,100^FD 3 of 9 ^FS ^PQ1,1 ^XZ	Cut and pause
^XA^S(CMP,M,T^FO100,100^FD 4 of 9 ^FS ^PQ1,0 ^XZ	
^XA^S(CMP,M,T^FO100,100^FD 5 of 9 ^FS ^PQ1,0 ^XZ	
^XA^S(CMP,M,T^FO100,100^FD 6 of 9 ^FS ^PQ1,1 ^XZ	Pause
^XA^S(CMP,M,T^FO100,100^FD 7 of 9 ^FS ^PQ1,0 ^XZ	
^XA^S(CMP,M,T^FO100,100^FD 8 of 9 ^FS ^PQ1,0 ^XZ	
^XA^S(CMP,M,C^FO100,100^FD 9 of 9 ^FS ^PQ1,0 ^XZ	Cut

Example 2: Specifying cutting and pausing after printing three labels for each ^XA-^XZ

^XA^S(CMP,M,C^FO100,100^FD1 of 9^SFd^FS ^PQ3^PP^XZ	Print three labels, cut, and pause
^XA^S(CMP,M,T^FO100,100^FD4 of 9^SFd^FS ^PQ3^PP^XZ	Print three labels and pause
^XA^S(CMP,M,C^FO100,100^FD7 of 9^SFd^FS ^PQ3^XZ	Print three labels and cut

5.4 Printing using ICM

Image Color Management (ICM) is a system for managing color information, so that consistent color information is maintained between different devices, such as displays and printers. In addition, a series of data for characterizing I/O devices related to color and color spaces that is used with this system according to standards from the International Color Consortium (ICC) is called an ICC profile.

With this function, the printer control software is used to load an ICC profile for a display and a printer, to make corrections based on the color information.

However, since displays and printers use different methods for generating color, the printed colors will not exactly match the colors that appear on screen.

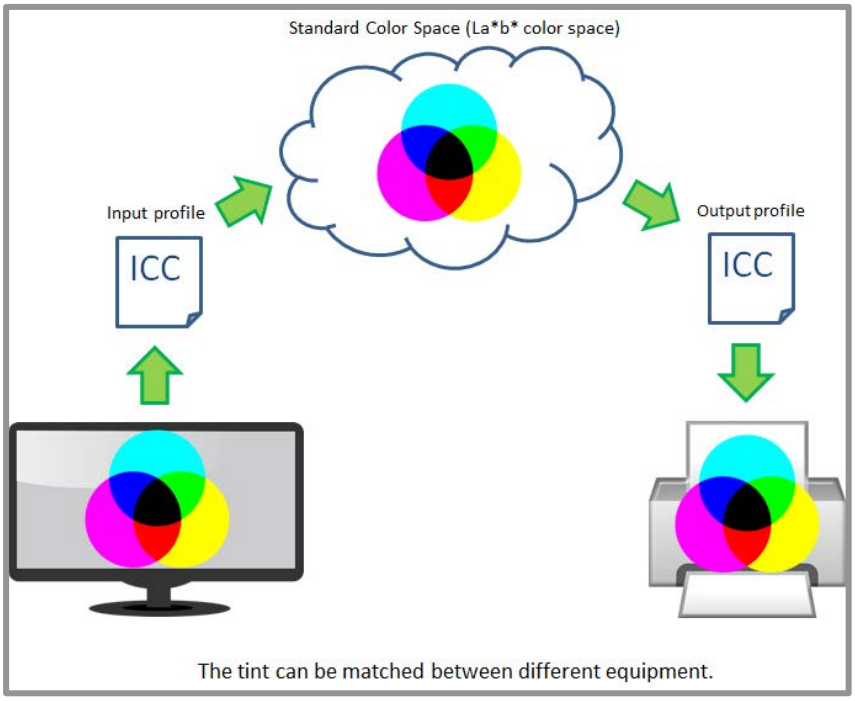


Figure 5.4-1 Application of an ICC profile

This section describes details about the printer control software regarding ICM.

5.4.1 Installing an ICC profile

Epson provides ICC profiles that support genuine paper for the CW-C8000 series.

For the ICC profiles, there is a single file for each combination of ink type, media coating type, and print speed, and which combination a file is to be applied to is made clear in the file name.

For example, with the CW-C8000 series, if using matte paper as the media coating type and 300 mm/s as the print speed, the media coating type (Matte Paper) and print speed (300) will be included in the file name as shown below. If gloss ink type is used for the ink type, the "_BK" suffix is added. If the matte ink type is used for the ink type, the "_MK" suffix is applied.

Example profile name

Gloss ink type: CW-C8000Series_MattePaper_300_BK.icc

Matte ink type: CW-C8000Series_MattePaper_300_MK.icc

The CW-C8000 series has 2 types of ink type, 7 types of media coating type, and 2 modes of print speed. Epson provides 28 files for these. The ICC profiles provided by Epson must be installed in a computer before this function can be used. It is recommended to install them when installing the printer control software.

Table 5.4.1-1 ICC profiles and file names for the gloss ink type

Media coating type	**Print speed**	**ICC profile and file name**
Plain Paper	300 mm/s	CW-C8000Series_PlainPaper_300_BK.icc
	150 mm/s	CW-C8000Series_PlainPaper_150_BK.icc
Matte Paper	300 mm/s	CW-C8000Series_MattePaper_300_BK.icc
	150 mm/s	CW-C8000Series_MattePaper_150_BK.icc
Synthetic	300 mm/s	CW-C8000Series_Synthetic_300_BK.icc
	150 mm/s	CW-C8000Series_Synthetic_150_BK.icc
Texture Paper	300 mm/s	CW-C8000Series_TexturePaper_300_BK.icc
	150 mm/s	CW-C8000Series_TexturePaper_150_BK.icc
Glossy Paper	300 mm/s	CW-C8000Series_GlossyPaper_300_BK.icc
	150 mm/s	CW-C8000Series_GlossyPaper_150_BK.icc
Glossy Film	300 mm/s	CW-C8000Series_GlossyFilm_300_BK.icc
	150 mm/s	CW-C8000Series_GlossyFilm_150_BK.icc
High Glossy Paper	300 mm/s	CW-C8000Series_HighGlossyPaper_300_BK.icc
	150 mm/s	CW-C8000Series_HighGlossyPaper_150_BK.icc

Table 5.4.1-2 ICC profiles and file names for the matte ink type

Media coating type	**Print speed**	**ICC profile and file name**
Plain Paper	300 mm/s	CW-C8000Series_PlainPaper_300_MK.icc
	150 mm/s	CW-C8000Series_PlainPaper_150_MK.icc
Matte Paper	300 mm/s	CW-C8000Series_MattePaper_300_MK.icc
	150 mm/s	CW-C8000Series_MattePaper_150_MK.icc
Synthetic	300 mm/s	CW-C8000Series_Synthetic_300_MK.icc
	150 mm/s	CW-C8000Series_Synthetic_150_MK.icc
Texture Paper	300 mm/s	CW-C8000Series_TexturePaper_300_MK.icc
	150 mm/s	CW-C8000Series_TexturePaper_150_MK.icc
Glossy Paper	300 mm/s	CW-C8000Series_GlossyPaper_300_MK.icc
	150 mm/s	CW-C8000Series_GlossyPaper_150_MK.icc
Glossy Film	300 mm/s	CW-C8000Series_GlossyFilm_300_MK.icc
	150 mm/s	CW-C8000Series_GlossyFilm_150_MK.icc
High Glossy Paper	300 mm/s	CW-C8000Series_HighGlossyPaper_300_MK.icc
	150 mm/s	CW-C8000Series_HighGlossyPaper_150_MK.icc

5.4.2 ICM setting

The items that the user sets for ICM, and a UI sample are shown below. These settings are enabled when the color correction type is set to ICM.

A list of the profiles in the setting items can be made with ICMAPI in Windows OS, described in the next section.

Table 5.4.2-1 User setting items

Item	**Description**	
Input profile	List the profile of the display device. The default is sRGB IEC61966-2.1 (OS default).	
Intent	Saturation	Convert while maintaining the saturation.
	Perception	Convert to an image that is natural in appearance. Use when the image data uses a wide range of colors. This setting is recommended as the default.
	Maintain relative color gamut	Convert so that the color coordinates of the original data match the color coordinates when the data is printed, and so that the color coordinates for white points (color temperature) also match. Use when there is a lot of color matching.
	Maintain absolute color gamut	Assign absolute color coordinates to both the original data and the print data before converting. The white points (color temperature) of both the original data and the print data are not subject to color correction. Use for special uses, such as when printing logo colors.
Output profile	Auto select	With default settings, only this option is displayed. The printer control software automatically applies the profile provided by Epson that corresponds to the ink type, media coating type, and print speed settings currently selected by the user. The ink type can be determined using the model information request command (~H(IMM).
	List all profiles (Options)	The profiles of all output devices (printers) installed in the computer are listed. The user can select whether to enable or disable the list in the options. It is disabled by default, and it is assumed it will be enabled when applying profiles created by the user themselves. The printer control software applies the profile selected by the user.

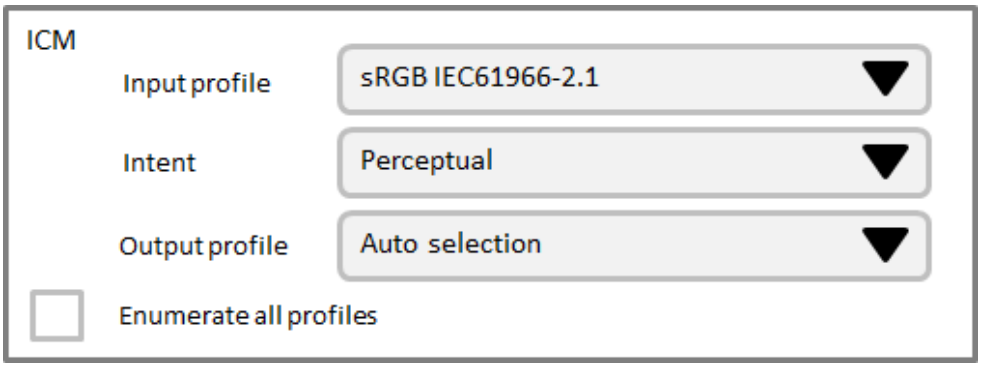


Figure 5.4.2-1 UI sample

When using the printer control software to apply ICM, it is not recommended to use this together with the spot color adjustment described previously. ICM might make changes to colors that have been specified with spot color adjustment.

5.4.3 Controlling ICM

ICM API in Windows OS is used to achieve ICM. The steps from displaying menus to applying ICC profiles and printing are shown below.

(1) Display menus.

1) Use GetColorDirectory() to acquire the path to the directory where the profile is saved.
2) Use EnumColorProfiles() to list the monitor class profiles.
3) Use EnumColorProfiles() to list the printer class profiles.

(2) Select menu items to determine the input profile, output profile, and intent.

1) If auto select is selected for the output profile, determine the output profile suitable for media coating type and print speed that are currently configured.

(3) Apply the ICC profile to an image.

1) Use OpenColorProfile() to acquire a handle for the profile
2) Use CreateMultiProfileTransform() to generate a color transform object from the I/O profiles.
3) Use TranslateBitmapBits() to transform colors from the color transform object created in (2) above and the current image (bitmap).
   If the image file is compressed, decompress it to a bitmap file in advance.
4) Use DeleteColorTransform() to discard the color transform object that was generated.
5) Use CloseColorProfile() to release the handle for the profile.

(4) Compress the image (after color transform) to a png file, and transmit it to the printer.

6 Printer Settings

This chapter describes printer settings other than printing.

When it is necessary to change these settings, such as when changing media, it is recommended to confirm that the printer is idling before transmitting the setting command. If data for a job that has not yet been printed remains in the printer when the settings are changed, the changed settings might unintentionally be applied to that print job.

Refer to "Chapter 4 Print Settings" for more information about differences between print settings and printer settings and points to note.

Table 6-1 List of printer settings

Category	**Function name**
Printer settings	Media form and media detection method setting
	Media source setting
	Media shape setting
	Nozzle self-test system setting
	Print start position adjustment
	Paper top position adjustment
	Cut / Specified stop position adjustment
	Reprint setting
	Unfinished label cut setting

The sequence from user settings to command transmission is shown below.

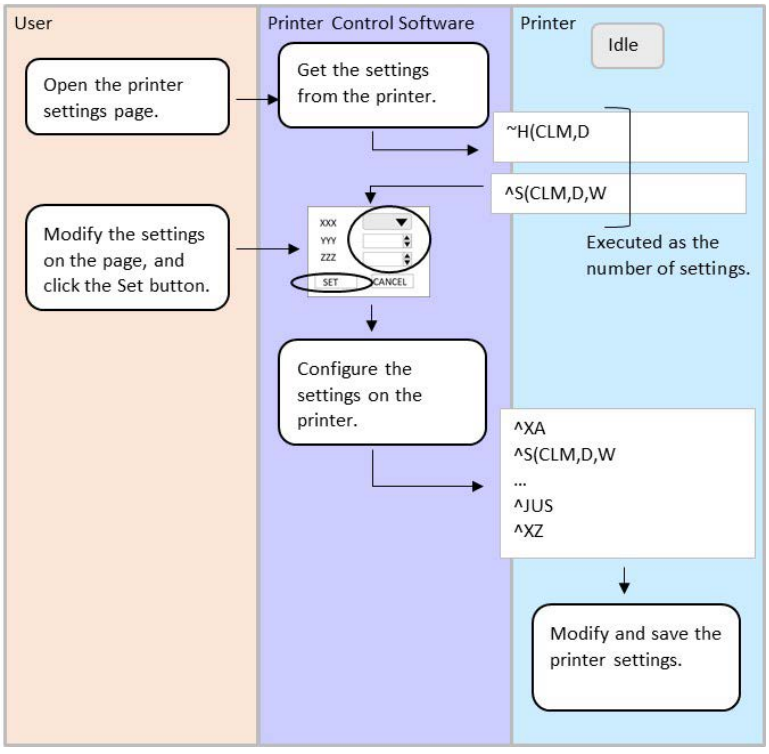


Figure 6-1 Printer settings sequence

6.1 Transmitting printer settings

The settings described in this section can be transmitted in a batch, or transmitted individually. To retain the settings in the printer even when its power is turned off, transmit the setting storage command (^JUS) at the end of the setting commands. If the printer control software does not support a particular setting item, the printer control software must not send a command related to that setting item. This is due to the fact that if the printer control software sends that command, the content that has been configured on the printer's panel or with the EPSON tool will no longer be applied to the printer operations.

In addition, to display the current setting values for the printer in the settings window, you can use the ~H(C command supported by the ^S(C command to acquire the setting values from the printer.

Examples of these commands are shown below.

[Acquire printer settings]	
~H(CLM,D	Acquire media detection method
[Response] ^S(CLM,D,W.	Media detection method is gap
	Repeat transmission of the acquisition command and the reception of a response in the same way.

[Printer settings]	
^XA	
^S(CLM,F,DL	Set media form to die-cut label
^S(CLM,D,W	Set media detection method to gap
^S(CLM,P,IR	Set media source to internal supply
^S(CLM,S,RP	Set media shape to roll paper
^S(CMV,C,6	Set nozzle clog tolerance to 6 [nozzles]
^S(CMV,A,E	Set cleaning after self-test to be executed
^S(CMV,S,D	Set nozzle self-test to disabled
^S(CMV,I,500	Set self-test interval to 500 [sheets]
^S(CMV,O,C	Set operation at clogged nozzle detection setting to Continue printing
^S(CMN,S,E	Set nozzle clogging recovery setting to enabled
^S(CLE,T,0	Set print start position adjustment (vertical) to 0
^S(CLE,M,0	Set print start position adjustment (horizontal) to 0
^S(CLP,T,0	Set paper top position adjustment to 0
^S(CLP,O,0	Set cut position adjustment to 0
^S(CWR,P,Y	Set reprint to enabled
^S(CWR,C,Y	Set unfinished label cutting to enabled
^JUS	Save settings
^XZ	

6.2 Media form and media detection method setting

■ Function description:

- Use this function to set the media form and label edge detection method (black mark, gap, no mark, hole).
- The media form and detection method that match the media set in the printer must be set.
- If it is not set properly, the printer cannot detect the label edge correctly.
- If the printer cannot detect the label edge correctly, an error will occur after a certain amount of media is fed.
- Select one of the following media forms.
  Die-cut label/Full-page label/Continuous paper/Tag
  Default setting: Die-cut label
- Select one of the following detection methods.
  Gap/Black mark/No mark/Hole
  Default setting: Gap
- A list of detection method settings for each media is shown below.

Table 6.2-1 List of detection method settings for each media

Media	**Media form**	**Detector setting**
Gap-basis die cut label	Die-cut label	Gap
Black mark-basis die cut label	Die-cut label	Black mark
Black mark-basis full-page label	Full-page label	Black mark
Full-page label with no mark	Full-page label	No mark
Black mark-basis continuous paper	Continuous paper	Black mark
Continuous paper with no mark	Continuous paper	No mark
Tag	Tag	Hole

■ Usage case:

- Set when changing to media with a different form.

■ Implementation recommendations:

- Selectable detectors are determined by the media form. The printer control software informs the user of the available selections based on media form.

■ Command(s) used:

- ^S(CLM,F ^S(CLM,D

6.3 Media source setting

■ Function description:

- Use this function to set the media source to be used in printing.
- Select one of the following media sources.

Table 6.3-1 List of media sources

Item	Description
Internal supply	Select if using roll paper set inside the printer. The supported media shape is roll paper.
External supply	Select if using paper set from the rear of the printer. Supported media shapes are roll paper and fanfold paper (folded paper).

Default setting: Internal supply

■ Usage case:

- Set this when changing the media source.

■ Command(s) used:

- ^S(CLM,P

6.4 Media shape setting

■ Function description:

- Use this function to set the media shape to be used in printing.
- Select one of the following media shapes.
  Roll paper / Fanfold paper
  Default setting: Roll paper

■ Usage case:

- Set this when changing the media shape.

■ Command(s) used:

- ^S(CLM,S

6.5 Nozzle self-test system setting

■ Function description:

- This function sets the timing for nozzle self-tests while printing, and the operation at clogged nozzle detection.
- What is a nozzle self-test?
  - This is a system for automatically detecting clogged nozzles when the printer is turned on and/or each time the number of sheets set by the user is printed.
  - If a clogged nozzle is detected, the user is notified according to the settings. The user can be notified to check the print result and decide to continue printing or cancel printing and the like.
  - If a clogged nozzle is detected, and if the number of clogged nozzles exceeds the tolerance value, cleaning is performed automatically according to the settings. This allows clogged nozzles to be resolved without the user doing any cleaning.

■ Usage case:

- Set if you want to minimize poor label printing due to clogged nozzles.

■ Command(s) used:

- ^S(CMV,S ^S(CMV,I ^S(CMV,O ^S(CMV,C ^S(CMV,A ^S(CMN,S

The setting items and their commands are shown below.

Table 6.5-1 List of setting values for the nozzle self-test system

Classification	**Item**	**Setting range**	**Recommended initial value**	**Command**
General settings	Nozzle clog tolerance value	0 to 10	6	^S(CMV,C
	Cleaning after self-test	Execute/ Do not execute during printing/ Do not execute	Execute	^S(CMV,A
Settings for detection during printing	Enable/disable function	Enable/Disable	Disable	^S(CMV,S
	Self-test interval	1 to 25000 [sheets]	500	^S(CMV,I
	Operation at clogged nozzle detection	Continue/Notify	Continue	^S(CMV,O
	Nozzle clog recovery	Enable/Disable	Enable	^S(CMN,S

6.6 Print start position adjustment

■ Function description:

- Use this function to make minor adjustments from the base vertical and horizontal positions of the print position.
- The base position for the vertical position is determined according to the media detection method.
- The base position for the horizontal position is the left gap from the left edge of the media.

■ Usage case:

- Use this function if the print position is not aligned with the label.

■ Command(s) used

- ^S(CLE,T or ^LT ^S(CLE,M

An image of how these adjustments are made is shown below.

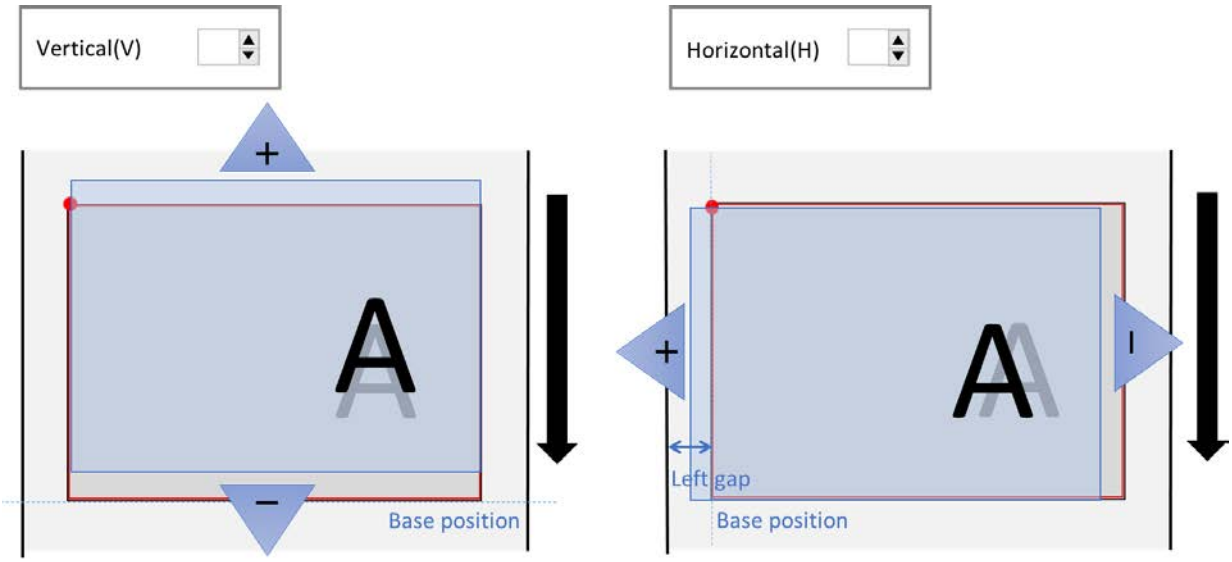


Figure 6.6-1 Print start position adjustment

The setting items and their commands are shown below.

Table 6.6-1 List of print start position adjustment setting values

Item	Setting range	Default setting	Command
Vertical direction [mm]	-2.0 to +2.0	0.0	^S(CLE,T
Horizontal direction [mm]	-1.0 to +1.0	0.0	^S(CLE,M

6.7 Paper top position adjustment

■ Function description:

- When the media form is tag, or when using a media form other than tag and the media detection method is “No mark”, this function is used to adjust the print position of the first label from the paper top.
- The setting range is 0 [mm] to 21.7 [mm].
  Default setting: 0.0 [mm]
- When the media form is tag, or when using a media form other than tag and the media detection method is “No mark”, by default, the paper top is used as the printing base position of the first label from the paper top. The position can be changed using this adjustment.
- When the media form is any one of die-cut label, full-page label, or continuous paper and the media detection method is “Gap” or “Black mark”, this adjustment value does not apply, because the printing base position is determined by the detector.
- This adjustment value does not apply to the printing of second and subsequent labels from the paper top.
- In connection with the print position, the adjustments of the print start position described in the preceding paragraph are also included.

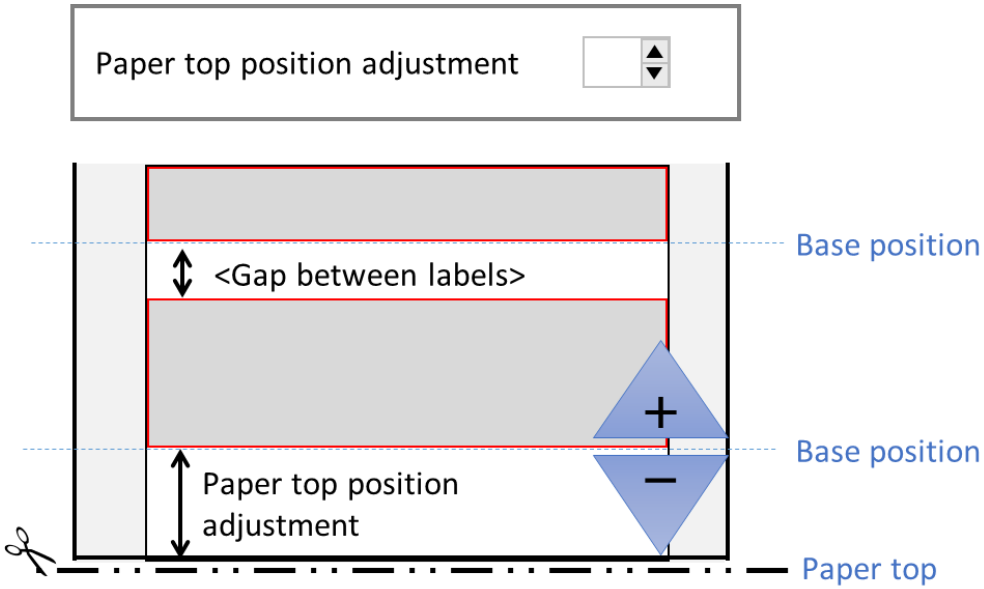


Figure 6.7-1 Paper top position adjustment

■ Usage case:

- This is used when you wish to provide a particular blank area before the start of the first label printing from the paper top.

■ Command(s) used:

- ^S(CLP,T

6.8 Cut / Specified stop position adjustment

■ Function description:

- This function adjusts the cut position or the specified stop position.
- The cut position adjustment is applied when the post-printing operation is set to stop at the cut position (Cut or Do not cut).
- The specified stop position adjustment is applied when the post-printing operation is set to stop at the specified stop position.

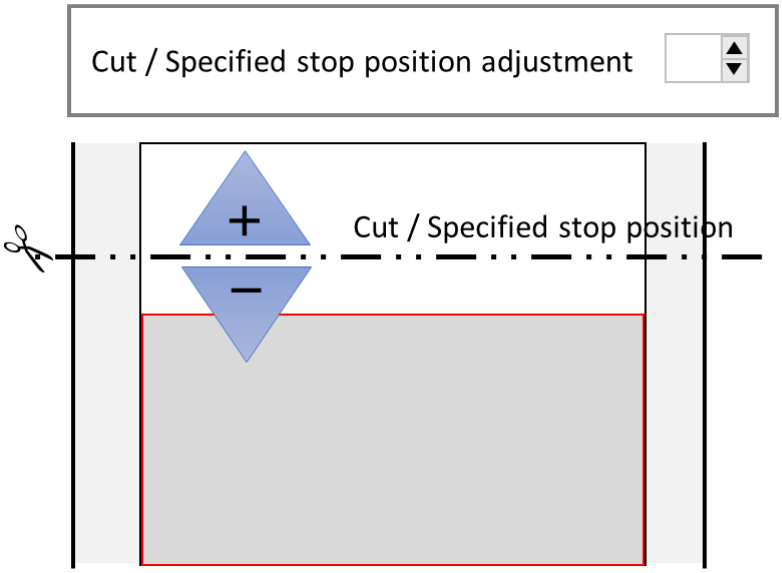


Figure 6.8-1 Cut / Specified stop position adjustment

■ Usage case:

- Use this to adjust the cut position or the specified stop position.
- If an external device connected to the printer performs cutting or peeling, adjust to a position that is appropriate for processing of the external device.

■ Command(s) used:

- ^S(CLP,O or ~TA ^S(CMQ,B

The adjustment items and their commands are shown below.

Table 6.8-1 List of cut / specified stop position adjustment setting values

Item	**Setting range [mm]**	**Default setting [mm]**	**Command**
Cut position	-20.0 to +1.5	0	^S(CLP,O or ~TA
Specified stop position	0.0 to 50.0	0	^S(CMQ,B

6.9 Reprint setting

■ Function description:

- This function sets whether to perform reprinting when an error, such as paper end, occurs during printing.
- Select the setting from the following.

  Enable/Disable

  Default setting: Enable

■ Usage case:

- Set if you want to change the reprint settings.

■ Command(s) used:

- ^S(CWR,P or ^JZ

6.10 Unfinished label cut setting

■ Function description:

- This function sets whether to cut unfinished labels in order to identify that printing has not been completed when an error, such as paper end, occurs during printing.
- Select the setting from the following.

  Enable/Disable

  Default setting: Enable

■ Usage case:

- Set if you want to change the cut setting for unfinished labels.

■ Command(s) used:

- ^S(CWR,C

7 Downloading TrueType Fonts

■ Function description:

- Use this function to download TrueType fonts (TTF files) to the printer.
- You can download TrueType fonts to the printer, and use the print function for TrueType fonts to print in a way true to the fonts installed in a device.

■ Reason(s) for this function:

- This is to enable printing of various character shapes.

■ Usage case:

- Use this function to print documents using a TrueType font.

■ Implementation recommendations:

- Inform the user that, when downloading a TrueType font to the printer, it is necessary to first get permission from the copyright holder of that font.

■ Command(s) used:

- ~DY (Use of the ~DU command is not prohibited, but ~DY is recommended.)

■ Notes

- Pay careful attention to the combination of the download command and the extension on the file name at the download destination. The reason is explained below.

The extension for font files that are downloaded and saved in the printer are determined by the download command that is used.

For ~DY the extension is TTF (when x = T is specified) or TTE (when x = E is specified). For ~DU, the extension is FNT.

Even if you specify an extension in the parameter for the download command, it will still be set as described above.

To access the font files that are stored in the printer, you must specify the extension for the file that is actually stored in the printer as the file extension for the command.

Commands for accessing font files: ^A@, ^CW, ^ID, ^H(Y, ^HW, ^WD

- When using downloaded fonts, be sure to set the character code set as necessary. In addition, depending on the character code set that is used, it might be necessary to set a character code conversion table. Character code sets and their character code conversion tables are shown in Table 7-1.

Table 7-1 List of character code sets and their character code conversion tables

Character code set	**^CI command**	**Character code conversion table Parameter d:o.x for ^SE**
KS X 1001(KS C 5601-1987)	^CI14	Z:EUCKR2K6.CNV
Shift-JIS	^CI15	Z:SJIS2K3.CNV
EUC-JP	^CI16	Z:EUCJPK7.CNV
EUC-CN	^CI16	Z:EUCCN199.CNV
BIG5	^CI26	Z:BIG52K7.CNV
GB18030	^CI26	Z:GB18030.CNV
UTF-8	^CI28	N/A
(Not recommended) UTF-8	^CI17^F8	N/A
(Not recommended, limitations) UTF-16	^CI17	N/A
(Cannot be used) UTF-16	^CI29, ^CI30	-

Request: Do not install UTF-16.

8 Printer Maintenance

This chapter describes printer maintenance. If printing is faded, marked with streaks, or in an unintended color, maintenance on the printer by the user is necessary. It is recommended to provide support for the maintenance items described in this chapter in the printer control software.

Table 8-1 List of printer maintenance items

Category	**Function name**
Maintenance	Head cleaning
	Print the clogged nozzle check pattern

The sequence from user operations to command transmission is shown below.

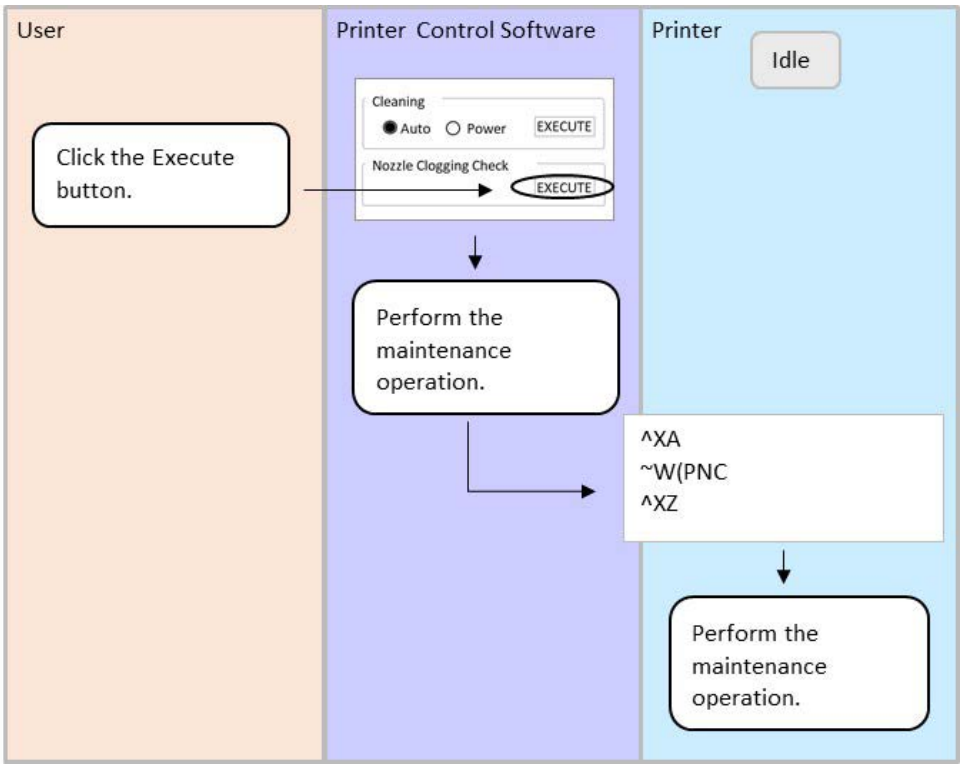


Figure 8-1 Printer maintenance sequence

8.1 Performing maintenance on the printer

When the user triggers a maintenance item, the corresponding command is transmitted.
Examples of these commands are shown below.

Example 1: Performing head cleaning

[Head cleaning]	
~J(MCL,A	Perform auto cleaning

Example 2: Printing the clogged nozzle check pattern

[Print the clogged nozzle check pattern]	
~W(PNC	Print check pattern

8.2 Head cleaning

■ Function description:
- This function performs head cleaning.
- It automatically checks for clogged nozzles and performs head cleaning.
- Select the cleaning type from the following.
  Auto/Power Cleaning

■ Reason(s) for this function:
- Nozzle clogging occurs.

■ Usage case:
- Use this if there are dots missing in the print data.

■ Implementation recommendations:
- Notify the user that a large volume of ink will be consumed when performing power cleaning.
- You can display a page that instructs the user to print out the clogged nozzle check pattern after head cleaning is complete and confirming that the printer is idling.

■ Command(s) used:
- ~J(C ~J(MCL

8.3 Print the clogged nozzle check pattern

■ Function description:
- This function prints the pattern for checking for clogged nozzles.
- The user visually checks the printed check pattern to determine if any nozzles are clogged.

■ Reason(s) for this function:
- This prints the nozzle check pattern to check if there are nozzles clogged.

■ Usage case:
- Use this to confirm there are no nozzles clogged before printing.

■ Implementation recommendations:
- This function can be used alone without head cleaning by the user.

■ Command(s) used:
- ~W(PNC

A UI sample for head cleaning and printing a clogged nozzle check pattern is shown below.

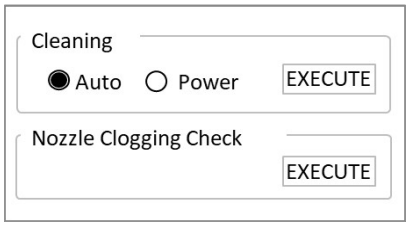


Figure 8.3-1 UI sample for head cleaning and printing a clogged nozzle check pattern

9 Displaying the Printer Status

This chapter describes the statuses that can be acquired from the printer, and shows examples of how they are displayed. It is recommended to provide support for the functions described in this chapter in the printer control software, so that the user can understand the status of the printer even from a remote location.

9.1 Displaying information about consumables

■ Function description:

- Use this function to acquire and display the status of consumables that are installed in the printer.
  - Consumables: Ink cartridges, maintenance box
  - The maintenance box stores waste ink.
- Display the latest status for consumables.

■ Usage case:

- The user checks to make sure consumables are not lacking before beginning printing.

■ Implementation recommendations:

- Display the amount of ink remaining in ink cartridges. (Refer to the UI sample.)
- Display the available capacity in the maintenance box. (Refer to the UI sample.)

■ Command(s) used:

- ~H(QIQ ~H(QMN

■ UI sample:

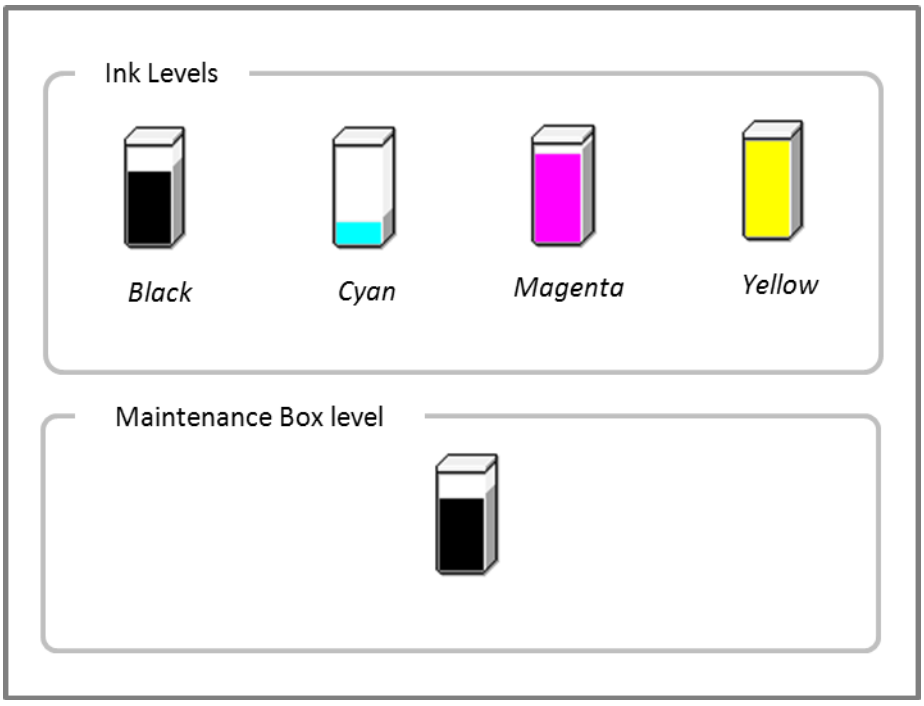
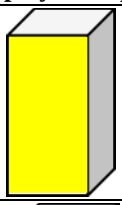
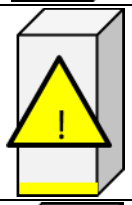
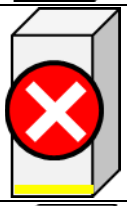


Figure 9.1-1 UI sample for displaying information for consumables

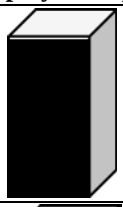
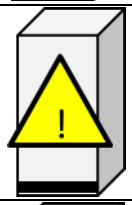
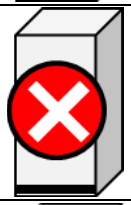
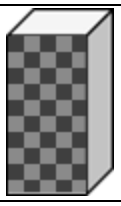
- The amount of ink remaining in ink cartridges is displayed for each color. Display with graphic icons or graphic icons plus text that make it easy to identify each of the following statuses.

Table 9.1-1 List of ink cartridge displays

Ink status	Display example	Notes
Sufficient ink remaining: RH Moderate ink remaining: RM Low ink remaining: RL		• Display an image that indicates the ink status that was acquired.
Ink cartridge replacement required soon: RN		
Ink cartridge replacement required: RR		• Display an image that shows little ink remaining.
Ink cartridge not installed: NA		
Ink cartridge installed: CI		• Indicate that ink cartridge installation was detected, but no ink is detected.

- Black indicates the available capacity in the maintenance box. As the available capacity drops, the area shown in black also grows smaller. Display graphic icons, or graphic icons plus text, that make it easy to identify each of the following statuses.

Table 9.1-2 List of maintenance box displays

Ink status	Display example	Notes
Sufficient available capacity in the maintenance box: RH Moderate available capacity in the maintenance box: RM Low available capacity in the maintenance box: RL		• Display an image that indicates the available capacity that was acquired.
Maintenance box replacement required soon: RN		
Maintenance box replacement required: RR		• Display an image that shows little available capacity in the maintenance box.
Maintenance box not installed: NA		
Maintenance box installed: CI		• Indicate that the maintenance box installation was detected, but no available capacity is detected.

10 Items to Keep in Mind Regarding Transmission

10.1 DeviceID

The Device ID is as follows.
MFG:EPSON;
CMD:ESCLABEL;
MDL: <Product Name>;
CLS:PRINTER;
DES:EPSON<SP><Product Name>;
CID:EPSONCWC<CID>;

Refer to "Chapter 2.2 List of product names" for <Product Name>.
<CID> indicates the last 4 digits (Example:"8010") or last 5 digits (Example: "8000u") of <Product Name>.
Refer to "Chapter 2.2 List of product names" for details.

10.2 String Descriptor

The String Descriptor is as follows.
idVendor = 04B8H
idProduct = 0E36H

iManufacturer ="EPSON“
iProduct = <Product Name>;

Refer to "Chapter 2.2 List of product names" for <Product Name>.

10.3 Receive buffer full control

■ Description:

- Due to the increased amount of data for color printers, it is easy for the printer's receive buffer to become full.
- The printer does not receive data when the receive buffer is full.
- Because the printer cannot receive data when the receive buffer is full, the status cannot be acquired using the status command.
- The printer receives data even during an error.
- If the printer continues to receive data during an error, the receive buffer may become full.

■ Recommended control:

- When registering graphics in the printer, use the printer information request command (for acquiring available capacity of drive) to acquire the available capacity of the drive.
- If space is available for the size of the graphic to be registered, transmit the data.
- Use the printer information request command (information request with full buffer) to request the receive buffer full status.
- If the receive buffer is not full, up to 4096 bytes of data will be sent.

■ Command(s) used:

- ~H(SDS,R ~H(SPB,F

10.4 Notes for when using printer information request commands

■ Description:

- If you want to request multiple statuses from the printer, you can combine printer information request commands and transmit them as one command group.

■ Recommended usage:

- If using command groups, confirm the responses from all the sent commands before sending the next command group.

■ Printer information request commands:

- ~H(C ~H(I ~H(Q ~H(S

10.5 Notes for when using commands that request a response from the printer

■ Description:

- If you send a "command that requests a response from the printer" followed by a "status request command" or "printer information request command", you may not be able to receive the correct response.

■ Recommended usage:

- Check the response to the "command that requests a response from the printer" before sending a "status request command" or "printer information request command".

■ Commands that request a response from the printer:

- ^HF ^HG ^HH ^HW ^HY

■ Status request commands:

- ~HI ~HM ~HS

■ Printer information request commands:

- ~H(C ~H(I ~H(Q ~H(S

10.6 Notes for when using both USB and network interface

■ Description:

- The printer processes the data of the interface which receives data first.
- When the printer is processing data received via USB, it receives data only from USB. (USB is selected)
- When the printer is processing data received via the network, it receives data only from the network. (Network is selected)
- While USB is selected, once the printer has completed processing the data received via USB, the printer can immediately receive data from the network.
- While network is selected, once the printer has completed processing the data received via the network, then the printer can immediately receive data from USB.

10.7 Cancel printing

■ Description:

- If you perform a spooler cancel or pull out the network cable to cancel printing, unnecessary data remains in the printer and you may not be able to send subsequent data.
- With the cancel button on the printer, you can select to either cancel the first format or cancel all formats. If you cancel the first format, the oldest of all the formats stored in the printer is deleted. If you cancel all formats, all of the labels stored in the printer are deleted.
- To delete unnecessary data, you must cancel all formats.

■ Recommended control:

- Encourage the user to cancel all formats using the printer's cancel button when canceling printing.

10.8 Limitations on acquiring printer status

With the CW-C8000 series, the printer status cannot be acquired by command under the conditions specified below.

If a command to acquire the printer status is issued during these operations, a response will be returned after the operations are completed.

- Currently reprinting from extended I/F
- Currently printing network status sheet and status sheet from printer's panel
- Currently printing nozzle check pattern from printer's panel
- Currently printing adjustment pattern from printer's panel
- Currently initializing with printer's panel
- Currently powering OFF from printer's panel
- Currently printing nozzle check pattern by command
- Canceling

REVISION SHEET (Summary)

Revision	Summary
A	Enactment
B	Updated according to changes in specifications • Paper top position adjustment • Cut position adjustment
	Added a function description • Unfinished label cut setting

REVISION SHEET (Detail)

Revision	Page or Subject	Detail
A	All	Newly enacted
B	72	Change in specifications: Changed the setting range for paper top position adjustment 0 to 3 → 0 to 21.7
	73	Change in specifications: Changed the setting range for cut position adjustment -10.8～+10.8 → -20.0～+1.5
	74	Added a function description for the unfinished label cut setting