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ESC/Label

Application Development Guide

for TM-C7500 series

EPSON	TITLE ESC/Label Application Development Guide for TM-C7500 series	SHEET REVISION C	NO.	
			NEXT	SHEET 1

TABLE OF CONTENTS

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1 Introduction

1.1 Outline

This document explains the necessary technical information for developing printer control software (drivers, utilities and application) for the TM-C7500 series using the ESC/Label command. For detailed specifications of the ESC/Label command, please refer to the ESC/Label Command Reference Guide. They will not be described in this document.

1.2 Applicable Scope

This document applies to the development of control software for the TM-C7500 series that use the ESC/Label command.

1.3 Reference Documents

- ESC/Label Command Reference Guide
- ESC/Label Command List

2 Basic Printing Method

This section describes how commands are structured, using printing a basic label as an example.

2.1 Points for structure Print Commands

- If you want to change printing settings for each print, send the setting command for each print.
  - The print settings can also be saved to the printer. However, we recommend that you send the setting command for each print for settings that are likely to change for each print. The settings for setting commands sent for each print are given priority over settings saved to the printer.
- To set settings for the label edge detector or paper media source, we recommend checking that the printer is idle then sending the setting command while replacing paper.
  - These settings are printer settings that are applied in print operations after the settings are changed. When changing settings, if there is still unprinted print data in the printer, the settings after the change may unintentionally be applied.

2.2 Basic Structure of Printing Commands

The following indicates the basic structure of commands sent for printing.

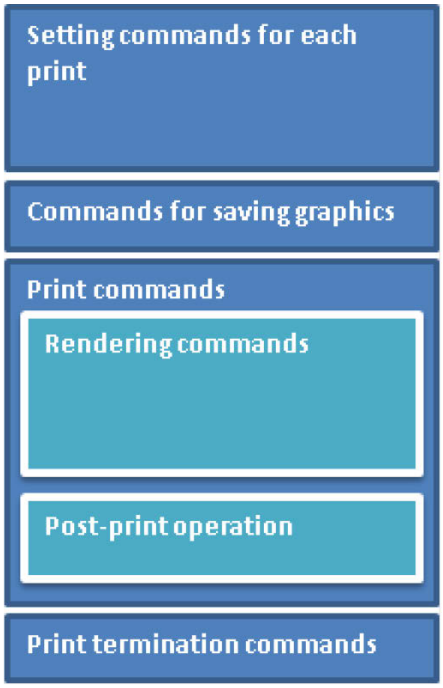


Figure 2-1 Basic Structure of Print Commands

Table 2-1 Description of Basic Structure of Print Commands

Item	Description
Setting commands for each print	Allocates commands that perform print settings for each print. Settings are unnecessary if printing using the setting values set in the printer. However, if there are other applications or drivers that use the printer, there is a possibility of the printer settings will be overwritten. Therefore, we recommend sending the commands for each print. And, delete the files that remain in the printer, and might become a potential cause of shortage of the drive space for command executions that follow (refer to the section 2.8.1 of ESC/Label Command Reference Guide).
Commands for saving graphics	Allocates commands for saving the graphics to be printed in the printer.
Print commands	Allocates commands related to printing and instructions for operation to the printer.
Rendering commands	Allocates commands for rendering print data such as text, barcodes, and graphics.
Post-print operation commands	Allocates commands for post-print printer operations such as the autocut, sounding the buzzer, and pause the printer.
Print termination commands	Allocates commands for cleaning up after the print. Delete the files registered for the print (refer to the section 2.8.1 of ESC/Label Command Reference Guide) , etc..

2.3 Example Printing Command

2.3.1 Description

In this example, imagine you are printing the label in Figure 2-2. The following indicates the main structures of the label.

- Use the TrueType font registered in the printer to print “Kotobuki-Koaka Tea Inc.” in green.
- Print an EAN-13 barcode.
- Print “IMG001.PNG”, an image of tree.

Figure 2-2 Sample Label

Also, for this example, imagine you are printing using the settings in Table 2-2.

Table 2-2 List of Sample Printing Settings

Item	Setting
Media coating type	Matte
Media form	Die-cut label
Label edge detection method	Black mark detection
Media width	2645 [dot] (112.0 [mm])[1]
Label width	2551 [dot] (108.0 [mm])[1]
Label length	3600 [dot] (152.4 [mm])[1]
Left gap	47 [dot] (2.0 [mm])[1]
Top margin	35 [dot] (1.5 [mm])[1]
Bottom margin	35 [dot] (1.5 [mm])[1]
Left margin	35 [dot] (1.5 [mm])[1]
Right margin	35 [dot] (1.5 [mm])[1]
Feather edges	Disable
Color correction	EPSON Standard
Ink profile and brightness adjustment	0
Ratio of black to composite setting	0
Bar width adjustment	0
Head maintenance	Continuous
Printing speed	12 [inch/sec] (300 [mm/sec])
Post-print operations	Autocut after printing is completed Buzzer does not sound after printing is completed Printer pauses after printing is completed

[1]The unit of the setting value can be selected from dot/mm/inch by ^S(CMP,U or ^MU command.

2.3.2 Commands

[Setting commands for each print]	
^XA	Begins label format.
^IDR:*.*^FS	Delete the files that remain in the printer.
^S(CLR,R,600	Sets the format base in dots per inch to 600 [dpi].
^S(CLR,P,600	Sets the print resolution to 600 [dpi].
^S(CLM,T,M1	Sets the media coating type to Matte1.
^S(CLM,F,DL	Sets the media form to Die-cut Label.
^S(CLM,P,IR	Sets the media source to internal roll.
^S(CLM,S,RP	Sets the media shape to roll paper.
^S(CLM,D,M	Sets the detection method to Black mark detection.
^S(CLS,P,2551	Sets the label width to 2551 [dot].
^S(CLS,L,3600	Sets the label length to 3600 [dot].
^S(CLS,G,47	Sets the left gap to 47 [dot].
^S(CLW,T,35	Sets the top margin to 1.5[mm].
^S(CLW,B,35	Sets the bottom margin to 1.5[mm].
^S(CLW,L,35	Sets the left margin to 1.5[mm].
^S(CLW,R,35	Sets the right margin to 1.5[mm].
^S(CPC,E,D	Sets the feather edges function to be not performed.
^S(CPC,C,N	Sets the color correction mode to EPSON Preferred Color.
^S(CPC,D,0	Sets the ink profile and brightne adjustment to 0.
^S(CPC,P,0	Sets the ratio of black to composite setting to 0.
^S(CPC,B,0	Sets the banding reduction to 0.
^S(CBW,C,0	Sets the bar width adjustment to 0.
^S(CMP,F,2	Sets the flush onto paper mode to 2.
^S(CMP,S,12	Sets the printing speed to 12 [inch/sec].
^S(CMP,M,C	Sets the printer operation mode to cutter.
^S(CLE,M,10	Adjusts the label left edge position to left 10[dot].
^S(CLE,T,12	Adjusts the label leading edge position to upper 12[dot].
^S(CLP,M,5	Sets the paper feed adjustment to 5[pixel]
^S(CMV,I,100	Sets the auto nozzle check interval to 100 labels.
^S(CMV,O,N	Sets the operation at clogged nozzle detection to notifying.
^XZ	Ends label format.
[Commands for saving graphics]	
~DYR:IMG001,B,P,39628,,	Saves the PNG file “IMG001.PNG” in the R drive.
[Print commands]	
^XA	Begins label format.
< Rendering commands >	
^FO216,216	Field origin: (216, 216)
^A@N,90,90,R:TT001.FNT	Calls up the TrueType font registered in the printer.

^F(C0,128,0,255,0,0,0,0,0,0	Sets the font color to green.
^FDKotobuki-Koaka Tea Inc.^FS	Prints “Kotobuki-Koaka Tea Inc.”.
^FO300,348	Field origin: (300, 348)
^A0,N,32,25	Sets the font to Font0.
^FD2070 Kotobuki-Koaka^FS	Prints “2070 Kotobuki-Koaka”.
^FO300,438	Field origin: (300, 438)
^A0,N,32,25	Sets the font to Font0.
^FDMatsumoto^FS	Prints “Matsumoto”.
^FO300,540	Field origin: (300, 540)
^BY9^BEN,360,Y,N^FD123456789012^FS	Prints the EAN-13 barcode.
^PON	Sets the printing direction to standard.
^FO1320,240	Field origin: (1320, 240)
^IMR:IMG001.PNG^FS	Loads the image saved in the R drive, “IMG001.PNG”.
< Post-print operation commands >	
^S(CUB,S,N	Sets for the buzzer not to sound after printing is completed.
^PQ1,1	Sets to pause printer after printing is completed.
^XZ	Ends label format.
[Print termination commands]	
^XA	Begins label format.
^IDR:*.*^FS	Delete the files registered for the print.
^XZ	Ends label format.

3 Functions to be implemented

3.1 List of Functions

Table 3-1 indicates a list of functions that mounted with the control software usually.

Table 3-1 List of Functions to be implemented

Category	Function name
Print setting	Media Coating Type Setting
	Media Layout Setting
	Completion Autocut Setting
	Completion Beeper Setting
	Completion Pause Setting
	Printing Color Correction Mode Setting
	Ink Profile and Brightness Adjustment Setting
	Ratio of Black to Composite Setting
	Bar Width Adjustment Setting
	Banding Reduction Setting
	Printing Speed Setting
	Head maintenance Setting
Printer setting	Label Edge Detector Setting
	Media Source Setting
	Nozzle Verification Technology Settings
	Printing Start Position Adjustment Setting
	Re-print Setting
	LED Notification Setting (Ink Cartridge Low)
	Paper feed Adjustment Setting
Download	TrueType Font Download
Display status	Display Consumables Information
Utility functions	Head Cleaning
	Print Nozzle Clogging Check Pattern

3.2 Media Coating Type Setting

- Function description:
  - Ø This function sets the media coating type to be used.
  - Ø The printer performs printing that is optimal for the media coating type set in this function.
  - Ø If the correct media coating type is not set, the picture quality may decrease.
  - Ø You can select the media coating type from the following:
    Plain / Synthetic / Matte1 / Matte2 / Glossy
    Default setting : Matte2
- Use case:
  - Ø Set when using for the first time or when you changed the paper.
- Recommendation in achievement:
  - Ø Please allow the user to simply change settings for each print.
- Command to be used
  - Ø ^S(CLM,T
- UI sample:

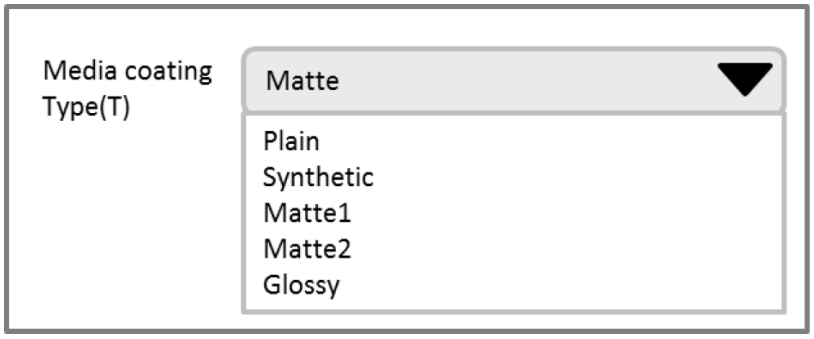


Figure 3-1 UI Sample for the Media CoatingType Setting

3.3 Media Layout Setting

n Function description:

- ØThis function sets the layout information for the media to be used.
- ØThe printer performs print processing using the media layout information set in this function.
- ØIf the correct media layout information is not set, a media size error occurs.
- ØFor the media layout, set the following information for each media form and label edge detection method.

² Die-cut label (Gap)

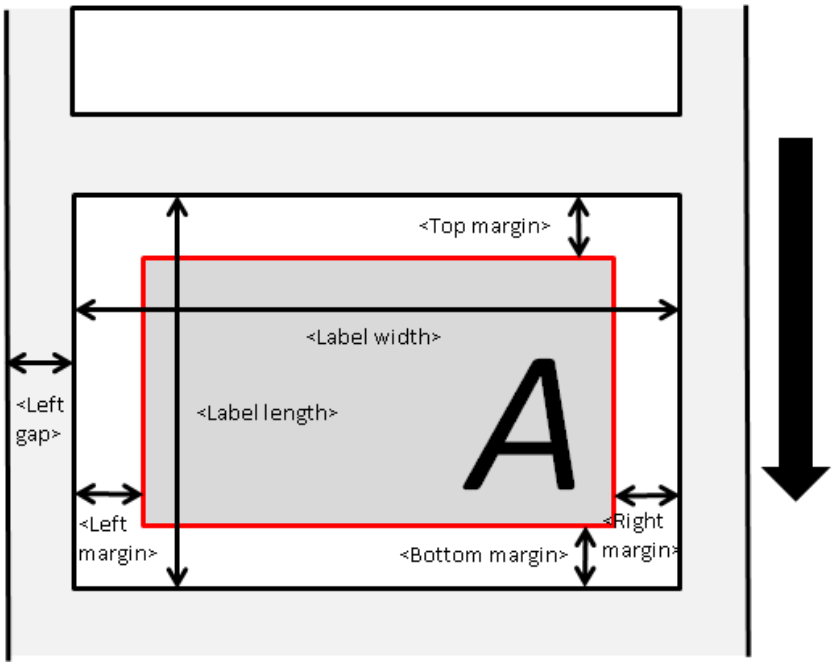


Figure 3-2 Die-cut Label (Gap) Layout

Table 3-2 Die-cut Label (Gap) Settings List

Item	Setting scope	Recommended initial value	Command
Label width [mm]	46.0 to 108.0	108.0	^S(CLS,P
Label length [mm]	25.4 to 600.0	152.75	^S(CLS,L
Left gap [mm]	1.5 to 2.5	2.0	^S(CLS,G
Top margin [mm]*	0 / 1.5	1.5	^S(CLW,T
Bottom margin [mm]*	0 / 1.5	1.5	^S(CLW,B
Left margin [mm]*	0 / 1.5	1.5	^S(CLW,L
Right margin [mm]*	0 / 1.5	1.5	^S(CLW,R
Feather edges function*	E / D	D	^S(CPC,E

* The feather edges function can be set to “E”(enable), only when all of margins(top/bottom/left/right) are set to 0.

2 Die-cut label (BM)

* BM: Abbreviation for black mark.

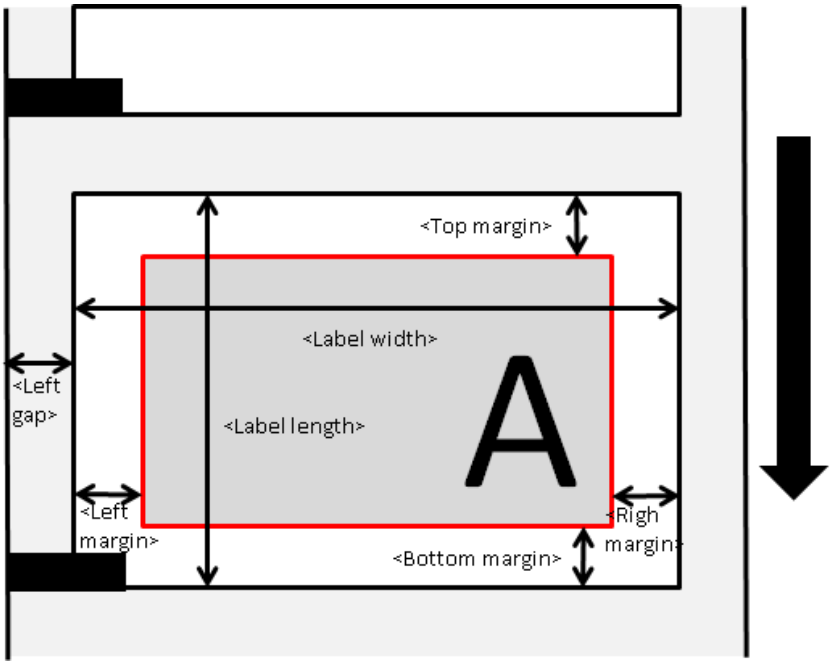


Figure 3-3 Die-cut Label (BM) Layout

Table 3-3 Die-cut Label (BM) Setting List

Item	Setting scope	Recommended initial value	Command
Label width [mm]	46.0 to 108.0	108.0	^S(CLS,P
Label length [mm]	25.4 to 600.0	152.75	^S(CLS,L
Left gap [mm]	1.5 to 2.5	2.0	^S(CLS,G
Top margin [mm]*	0 / 1.5	1.5	^S(CLW,T
Bottom margin [mm] *	0 / 1.5	1.5	^S(CLW,B
Left margin [mm] *	0 / 1.5	1.5	^S(CLW,L
Right margin [mm] *	0 / 1.5	1.5	^S(CLW,R
Feather edges function*	E / D	D	^S(CPC,E

*The feather edges function can be set to “E”(enable), only when all of margins(top/bottom/left/right) are set to 0.

2 Continuous label (No detection)

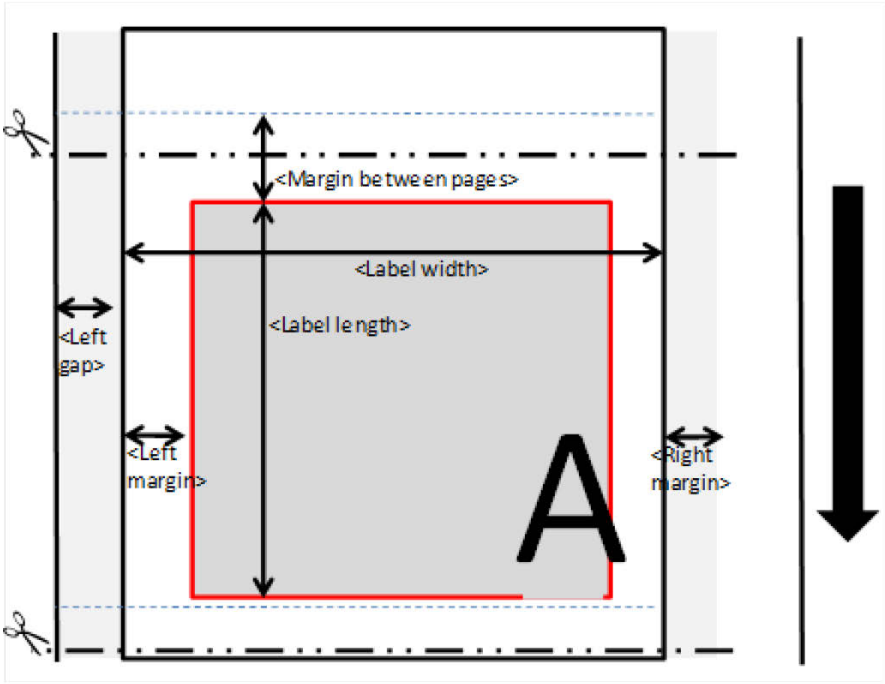


Figure 3-4 Continuous label (No detection) Layout

Table 3-4 Continuous label (No detection) Setting list

Item	Setting scope	Recommended initial value	Command
Label width [mm]	46.0 to 108.0	108.0	^S(CLS,P
Label length [mm]	28.4 to 600.0	152.75	^S(CLS,L
Margin between pages [mm]	3.0 [mm] (Fixed)	-	-
Left gap [mm]	1.5 to 2.5	2.0	^S(CLS,G
Top margin [mm]*	0 (Fixed)	0.0	^S(CLW,T
Bottom margin [mm]*	0 (Fixed)	0.0	^S(CLW,B
Left margin [mm]*	0 / 1.5	1.5	^S(CLW,L
Right margin [mm]*	0 / 1.5	1.5	^S(CLW,R
Feather edges function*	E / D	D	^S(CPC,E

*The feather edges function can be set to “E”(enable), only when all of margins(top/bottom/left/right) are set to 0.

2 Continuous label (BM)

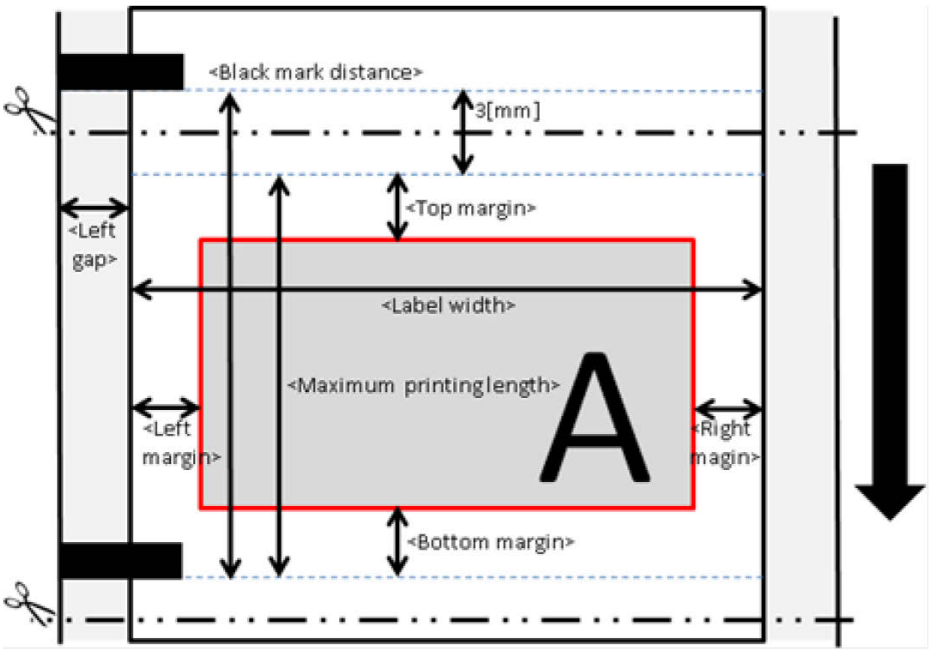


Figure 3-5 Continuous Label (BM) Layout

Table 3-5 Continuous Label (BM) Settings List

Item	Setting scope	Recommended initial value	Command
Label width [mm]	50.0 to 108.0	108.0	^S(CLS,P
Black mark distance [mm]	28.4 to 603.0	155.75	-
Print length	25.4 to Maximum printing length	152.75	^S(CLS,L
Maximum printing length [mm]	Black mark distance - 3,0 [mm] (Fixed)	152.75	-
Left gap	1.5 to 2.5	2.0	^S(CLS,G
Top margin [mm]*	0(Fixed)	0.0	^S(CLW,T
Bottom margin [mm]*	0(Fixed)	0.0	^S(CLW,B
Left margin [mm]*	0 / 1.5	1.5	^S(CLW,L
Right margin [mm]*	0 / 1.5	1.5	^S(CLW,R
Feather edges function*	E / D	D	^S(CPC,E

*The feather edges function can be set to “E”(enable), only when all of margins(top/bottom/left/right) are set to 0.

- Use case:
  - Set when using for the first time or when you changed the paper.
- Recommendation in achievement:
  - Please allow the user to simply change settings for each print.
    - We recommend that the user register the media layout in advance, and select from among the registered media layouts when printing.
  - If the margin is set to 0 [mm], the ink may run over the edge of the label. Please indicate to the user that when setting margin to 0 [mm], there is a risk of ink running over.
    - Example message:
      "The printing may run over the edge of the label. Please ensure margins of 1.5 [mm] or larger in the print data so that the printing does not run over the edge of the label."
- Commands to be used:
  - ^S(CLS,G, ^S(CLS,L ^S(CLS,P
  - ^S(CLW,B, ^S(CLW,L, ^S(CLW,R, ^S(CLW,T

3.4 Completion Autocut Setting

- Function description:
  - Ø This function designates the timing for the autocut.
  - Ø We recommend the following for the autocut timing.

Table 3-6 Autocut Timing List

Timing	Description
Cut at job end	Cuts after printing the last printing label.
After specified number of labels	Cuts after every number of labels specified by the user.

- Use case:
  - Ø Use when you want to separate each print.
  - Ø Use when you want to separate the print in units of multiple sheets.
- Command to be used:
  - Ø ^PQ
- UI sample:

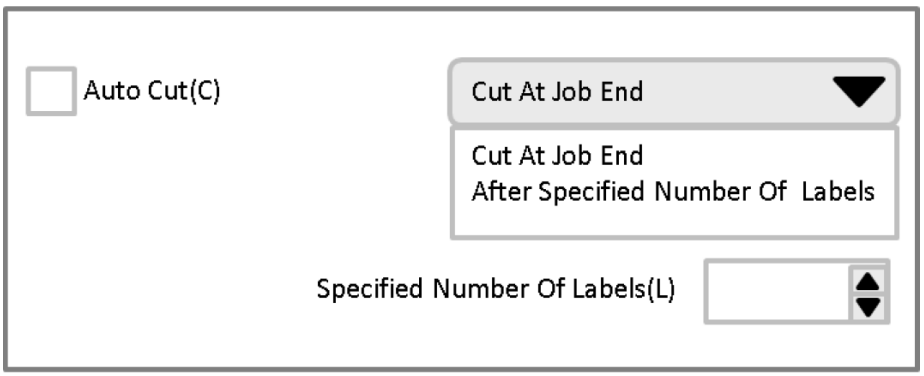


Figure 3-6 UI Sample for the Completion Autocut Setting

3.5 Completion Beeper Setting

n Function description:

Ø The function sounds the buzzer equipped in the printer at the print competion timing designated by the user.

Ø We recommend the following timing to sound the buzzer.

Table 3-7 Buzzer Sounding Timing List

Timing	Description
No beep	Not sounds the buzzer after printing.
Beep at job end	Sounds the buzzer after printing the last label.

n Use case:

Ø Use to notify by sound that printing has been completed in units specified by the user.

n Recommendation in achievement:

Ø Please allow the user to simply change settings for each print.

n Command to be used:

Ø ^S(CUB,S

n UI sample:

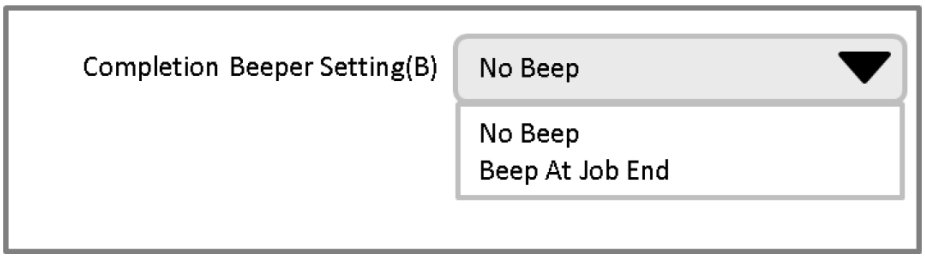


Figure 3-7 UI Sample for the Completion Beeper Setting

3.6 Completion Pause Setting

- Function description:
  - Ø This function pauses the printer at the print completion timing specified by the user.
  - Ø We recommend the following timing to pause the printer.

Table 3-8 Pause Printer Timing List

Timing	Description
Pause at cut	Pause the printer after performing an autocut.
Pause at job end	Pause the printer after printing the last label.

- Use case:
  - Ø Use when the user performs procedures such as removing the paper after printing.
- Command to be used:
  - Ø ^PQ
- UI sample:

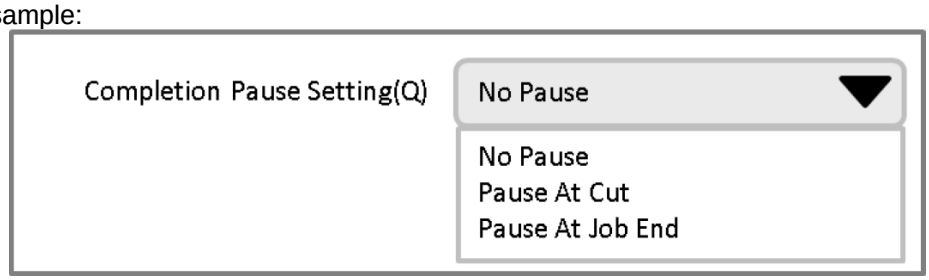


Figure 3-8 UI Sample for the Completion Pause Setting

3.7 Printing Color Correction Mode Setting

- Function description:
  - Ø This function sets the correction mode for the printing color to match the printed contents.
  - Ø The printer uses the color correction mode set in this function to correct the color so that the printing result is optimal.
  - Ø Select the correction mode from the following.

Table 3-9 Color Correction Mode List

Item	Description
EPSON Preferred Color	Prints using optimal color correction to selected media coating type.
EPSON Standard	Prints with matching to sRGB color space, does not use color correction to the image.

- Use case:
  - Ø Set the optimal color correction mode for the printed contents.
- Recommendation in achievement:
  - Ø Please allow the user to simply change settings for each print.
    - With this setting, the user needs to select a color adjustment setting to match the printed contents. Therefore, please guide users so that they can select a choice based on the printing contents.
    - Example: Include a message below in the Help menu.
      - "EPSON Preferred Color" is suitable for usual case.
      - When you want to arrange color, please select "EPSON Standard".
      - Even if which item is selected, the print result does not match necessarily to the color displayed.

- Command to be used:
  - Ø ^S(CPC,C
- UI sample:

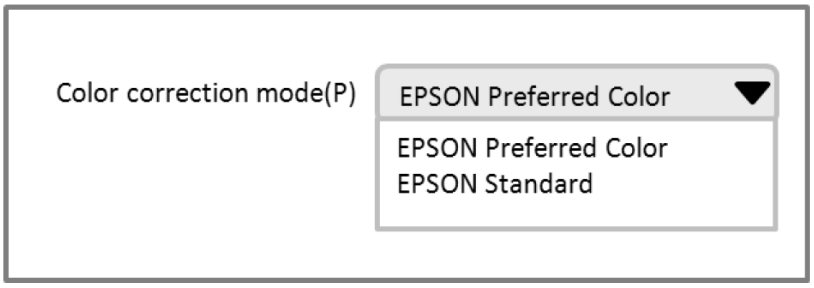


Figure 3-9 UI Sample for the Color Correction Mode Setting

3.8 Ink Profile and Brightness Adjustment Setting

- Function description:
  - Ø This function sets the adjustment values from the standard values of the ink profile and brightness.
  - Ø If you change the settings, the ink profile (amount of ink used) during printing changes.
  - Ø Default is the standard. You can set 6 stages for “light” and 4 stages for “dark” (for a total of 11 stages). If Matte2 is specified as media coating type, you can set only 6 stages for “light”.

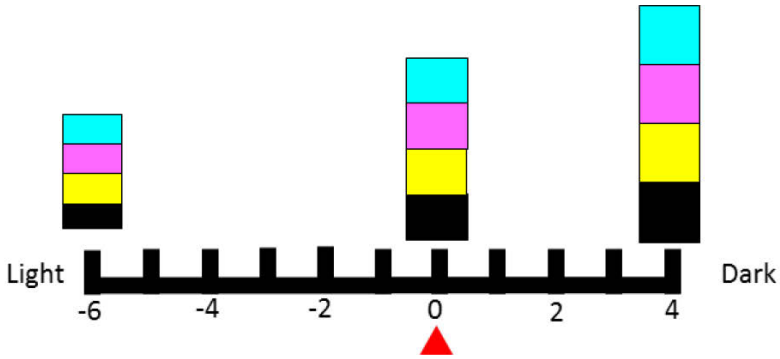


Figure 3-10 Image of Ink Profile Amounts

- Use case:
  - Ø Use to make the printed result lighter or darker depending on the media coating type and the printed contents.
- Recommendation in achievement:
  - Ø Please allow the user to simply change settings for each print.
  - Ø If you set the ink profile and brightness towards light, it may decrease the scan quality of barcodes. Please indicate to users that if they change the ink profile and brightness, there is a risk the scan quality will decrease for barcodes.
- Command to be used:
  - Ø ^S(CPC,D
- UI sample:

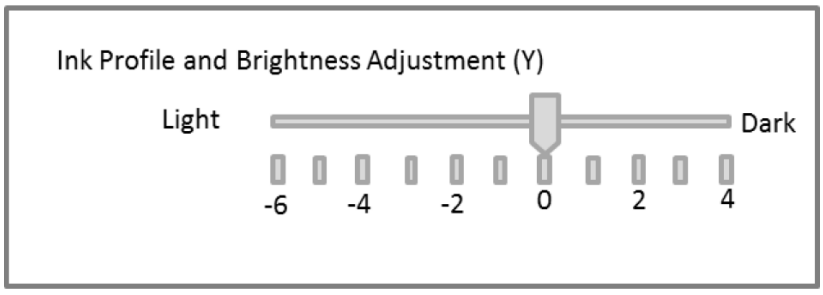


Figure 3-11 UI Sample of the Ink Profile and Brightness Adjustment Setting

3.9 Ratio of Black to Composite Setting

n Function description:

Ø This function sets the adjustment value for the ratio of ink constituting black.

Ø Change this setting to change the ratio of ink used when printing black.

Ø Default is the standard. When the media coating type is Matte1/Matte2/ Glossy, you can set 6 stages to “CMY” and 4 stages to “K” (for a total of 11 stages).

Ø When the media coating type is Plain/ Synthetic, you can set 6 stages to “CMY”.

Ø Setting the adjustment towards “CMY” reduces the ratio of black ink. Setting the adjustment towards“K” increases the ratio of black ink. If the ratio of black ink is high, the ink becomes more likely to be scraped off.

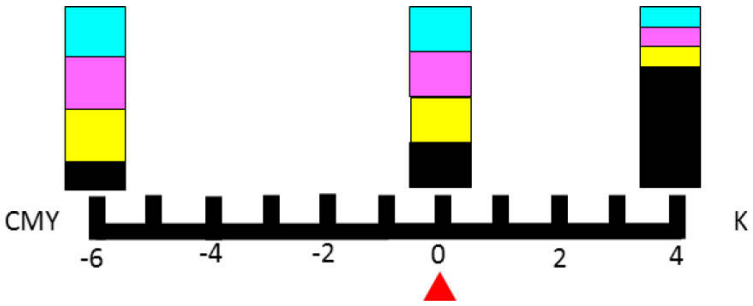


Figure 3-12 Image for the Ratio of Black Ink

n Use case:

Ø Check the printed material. If the ink is scraped off easily, set towards “CMY”.

² Depending on the quality of the paper, if you print using the default ratio of black to composite setting, the black ink may be scraped off easily. If this phenomenon occurs, set towards “CMY”.

n Recommendation in achievement:

Ø Please allow the user to simply change settings for each print.

Ø If you change the ratio of black to composite setting, it may decrease the scanning quality of barcodes. Please indicate to users that if they change the ratio of black to composite setting, there is a risk the scan quality will decrease for barcodes.

n Command to be used:

Ø ^S(CPC,P

nUI sample:

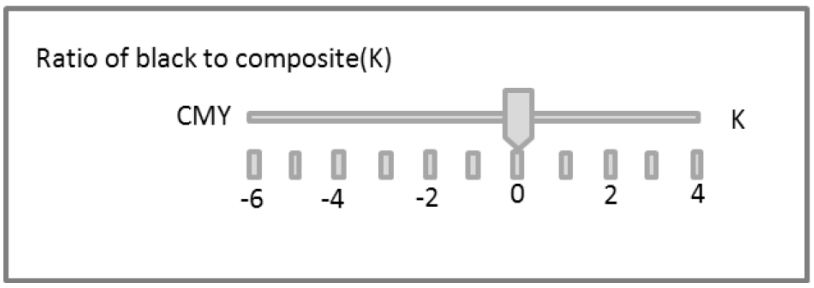


Figure 3-13 UI Sample for the Ratio of Black to Composite Setting

3.10 Bar Width Adjustment Setting

- Function description:
  - Ø This function sets the adjustment value for the bar width.
  - Ø If you change this setting, the bar width adjustment value for printing barcodes is changed.
  - Ø What is bar width adjustment?
    - Bar width adjustment is a function to prevent a decrease in barcode scanning quality from ink running by adjusting the bar width of the barcode.
    - Applicable 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
    - The bar width changes by 1 dot, when the bar width adjustment value is changed by 1 step.
    - When the bar width adjustment value is default(0), the bar width is narrowed by 2 dots more than the width calculated by the standard of each symbol.
  - Ø Note:
    - Bar width adjustment is performed even in default settings to increase barcode scanning quality.
- Use case:
  - Ø Set when you scan a barcode printed on the paper actually used, and the scan quality was insufficient.
- Recommendation in achievement:
  - Ø Please allow the user to simply change settings for each print.
  - Ø If you change the bar width adjustment value, the barcode scan quality may decrease. Please indicate to users that if they change the bar width adjustment value, there is a risk that the barcode scan quality may decrease.
- Command to be used:
  - Ø ^S(CBW,C
- UI sample:

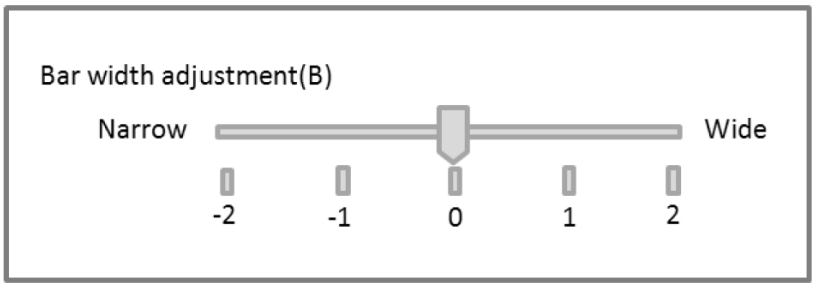


Figure 3-14 UI Sample for the Bar Width Adjustment Setting

3.11 Banding Reduction Setting

- Function description:
  - Ø This function sets the adjustment values to reduce vertical banding in the print result.
  - Ø Default is the standard. You can set 2 stages for “light” and 2 stages for “dark” (for a total of 5 stages).
  - Ø Set the adjustment for “light” when the band darker than surroundings is printed, set the adjustment for “dark” when the band lighter than surroundings is printed.
- Use case:
  - Ø Set when vertical banding (Light color band or dark color band) occur in the print result depending on the media coating type.
- Recommendation in achievement:
  - Ø Please allow the user to simply change settings for each print.
- Command to be used:
  - Ø ^S(PC,B
- UI sample:

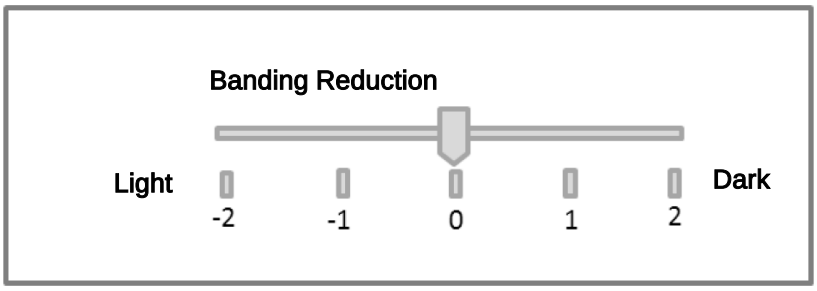


Figure 3-15 UI Sample for the Bading Reduction Setting

3.12 Printing Speed Setting

- Function description:
  - Ø This function sets the printing speed.
- Use case:
  - Ø Make the printing speed slower if printing is stopped midway and the paper is fed in reverse to continue printing.
    - This happens when the data transfer speed may not be fast enough depend on the printed contents.
    - This happens when the take-up speeds of re-winder made by 3rd party are slower than printing speed.
- Recommendation in achievement:
  - Ø Please allow the user to simply change settings for each print.
- Command to be used:
  - Ø ^S(CMP,S
- UI sample:

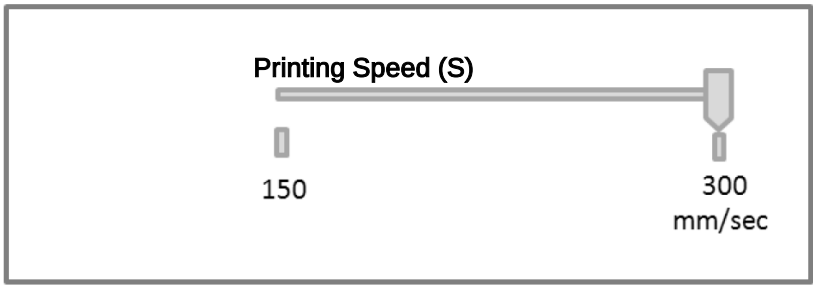


Figure 3-16 UI Sample for Printing Speed Setting

3.13 Head maintenance Setting

n Function description:

Ø This function sets whether to prioritize through-put or printing quality when printing.

Ø You can switch between the following print settings using this setting.

Table 3-10 Head Maintenance Setting

Head maintenance	Print settings
Continuous printing(fast)	Flush onto paper mode: Level 2
Pause for maintenance(fine)	Flush onto paper mode: Level 1

Ø When “Continuous printing” is set, print quality is decreased, so the through-put is increased when printing multiple labels.

Ø When “Continuous printing” is set, extra ink is discharged on the printed surface, and may stand out.

Ø What is flush onto paper mode?

² For the higher level of the flush onto paper mode, the printing quality will decrease because more ink is discharged. On the other hand, the improvement of throughput when printing multiple labels is expected, because the period between regular flushing that discharges ink with the head moving away is increased.

n Use case:

Ø Set when you want to prioritize print quality over through-put.

n Recommendation in achievement:

Ø Please allow the user to simply change settings for each print.

n Command to be used:

Ø ^S(CMP,F

n UI sample:

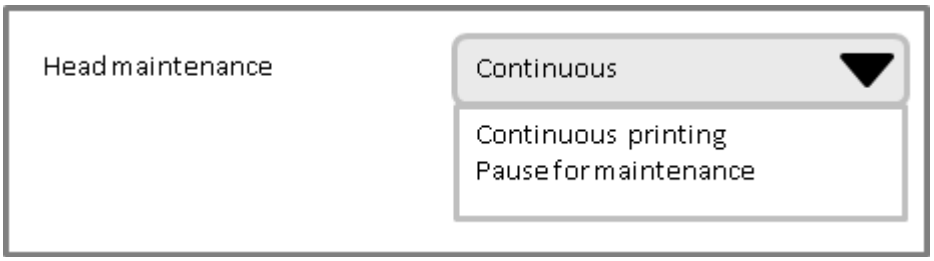


Figure 3-17 UI Sample for Head maintenance Setting

3.14 Label Edge Detector Setting

n Function description:

- Ø This function sets the label edge detection method (black mark detection, gap detection or no detection).
- Ø The detection method needs to be set based on the media set in the printer.
- Ø This is a printer setting, and we recommend being able to change this setting separately from print settings.
- Ø Check that the printer is idle before notifying the printer of the setting change.
- Ø If it is not set properly, the printer will not detect the label edge.
- Ø If the printer does not detect the label edge, an error will occur once a certain amount of paper is fed.
- Ø You can select the label edge detector from the following:
  Gap detection / Black mark detection / No detection
  Default setting : Gap detection
- Ø The following is a list of settings for the detector for each media.

Table 3-11 List of Detector Settings for each Media

Media	Detector setting
Die-cut label with Gap	Gap detection
Die-cut label with black mark, continuous paper	Black mark detection
Continuous label without black marks	No detection

n Use case:

- Ø Set the label edge detector after changing to a media with a different detection method.

n Command to be used:

- Ø ^S(CLM,D

3.15 Media Source Setting

n Function description:

- Ø This function sets the media source for the paper used in printing.
- Ø This is a printer setting, and we recommend being able to change this setting separately from print settings.
- Ø Check that the printer is idle before notifying the printer of the setting change.
- Ø Select the media source from below.

Table 3-12 List of Media Sources

Item	Description
Internal roll	Select when using roll paper set inside the printer. Roll paper is supported as media shape.
External feed	Select when using paper set from the rear of the printer. Fanfold paper is supported as media shape.

n Use case:

- ØSet when you changed the media source.
  - ² Example: Changed from the internal roll to the external feed.

n Command to be used:

- Ø^S(CLM,P ^S(CLM,S ^S(CLM,F

n Supported combination of media shape and media form:

- ØDepending on media source, the supported combination of media shape and media form is listed in Table 3-13 List of combination.

Table 3-13 List of combination

Media source	Media shape	Media form	Support
Internal roll	Roll paper	Die-cut label	ü
		Contiuous label	ü
External feed	Fanfold paper	Die-cut label	ü

3.16 Nozzle Verification Technology Settings

n Function description:

Ø This function sets the timing of nozzle verification and the operation at clogged nozzle detection.

Ø What is the nozzle verification technology?

- If the clogged nozzle is detected in nozzle verification, auto cleaning is executed.
  - If the nozzle clogging is not recovered from by the cleaning, it reduces deterioration of printing result by dot subsituation.
- The nozzle verification can be set while printing multiple labels.
  - The printer automatically detects the print beginning point. The number of sheets of the print from the print beginning point to the nozzle verification can be specified.
  - The user can correspond (confirm print result / continue print / cancel , etc) by notification when the clogged nozzle is detected.
- Note:
  - The nozzle verification is executed before start printing in “None” setting.

n Use case:

Ø Set when you want to minimize the possibility of printing defective labels by clogged nozzle.

n Command to be used:

Ø ^S(CMV,I ^S(CMV,O

n UI sample:

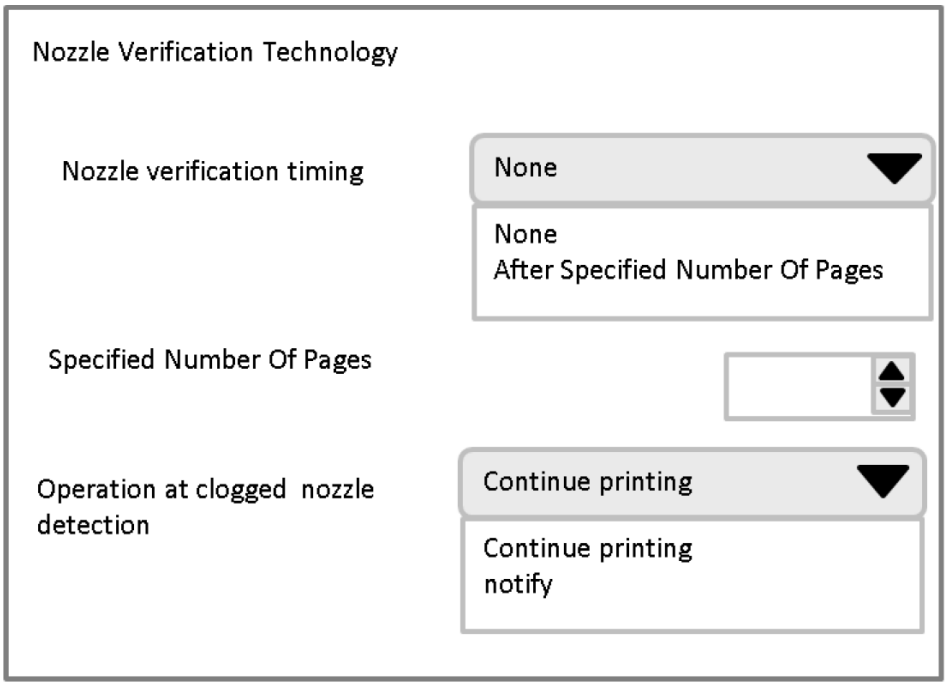


Figure 3-18 UI Sample for the Nozzle Verification Technology

3.17 Printing Start Position Adjustment Setting

- Function description:
  - Ø This function adjusts the printing start position for the printer.
  - Ø If the printing start position is changed, printing is started in a position shifted the adjustment amount from the position set for the print data.
- Use case:
  - Ø Use when you want to adjust the printing position without changing the application settings.
- Commands to be used:
  - Ø ^S(CLE,M, ^S(CLE,T or ^LT
- UI sample:

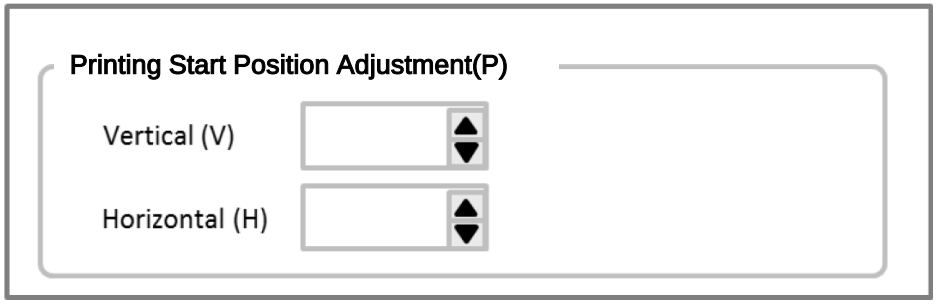


Figure 3-19 UI Sample for the Printing Start Position Adjustment Setting

3.18 Re-print Setting

- Function description:
  - Ø This function sets whether to perform re-printing when an error, such as paper out, occurs during printing.
- Use case:
  - Ø Use when you want to change the re-print settings.
- Command to be used:
  - Ø ^S(CWR,P, ^JZ
- UI sample:

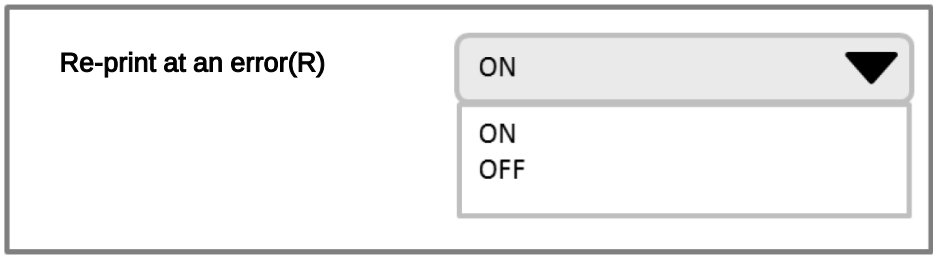


Figure 3-20 UI Sample for the Reprint Setting

3.19 LED Notification Setting (Ink Cartridge Low)

- Function description:
  - Ø This function sets whether to notify the user through the LED that the printer's ink cartridge is low.
- Use case:
  - Ø Use when you want to change the LED notification method when the ink cartridge is low.
- Command to be used:
  - Ø ^S(CSL,N
- UI sample:

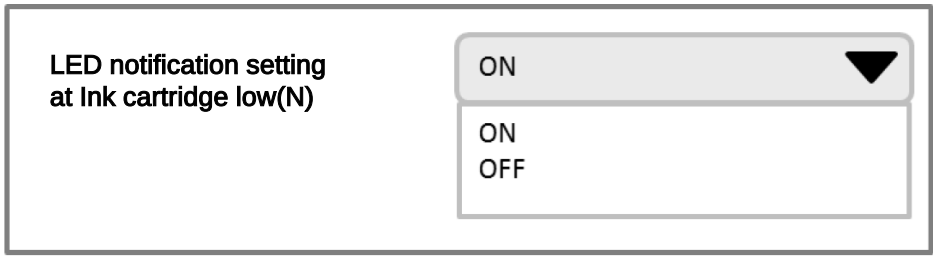


Figure 3-21 UI Sample for the LED Notification Setting (Ink Cartridge Low)

3.20 Paper Feed Adjustment Setting

- Function description:
  - Ø This function adjust CMYK ink position alignment shot onto label.
- Use case:
  - Ø Use when you want to change label type.
- Recommendation in achievement:
  - Ø A set result of the paper feed adjustment is confirmed by printing the paper feed adjustment pattern. Not only the paper feed adjustment but also it is necessary to set media coating type, media shape, media form and media setting(label width and left gap) to print the paper feed adjustment pattern. When these settings are changed, it is preferable to execute each set command.
  - Ø Please refer to the section 6 for detail procedure of the paper feed adjustment.
- Command to be used:
  - Ø ^S(CLP,M
- UI sample:

Figure 3-22 UI Sample for the Paper Feed Adjustment Setting

3.21 TrueType Font Download

- Function description:
  - Ø This function downloads TrueType fonts (TTF files) to the printer.
  - Ø You can download a TrueType font to the printer and can print in the same way as the fonts loaded in the device using the TrueType font printing function.
- This function is necessary because:
  - Ø By downloading a TrueType font to the printer, you can print using the same amount of data as the fonts loaded in the device.
- Use case:
  - Ø Use when you want to print using a TrueType font.
- Recommendation in achievement:
  - Ø Please indicate to users that they must obtain the permission of the copyright owner of the font before they download the font to the printer.
- Command to be used:
  - Ø ~DY (We recommend it than ~DU.)
- Supplementation:
  - Ø You should take care of the combination of a download command and a extension of a file stored as a destination of a download. The reasons are described in the following.

    A extension of a font file which is stored in a printer is decided by a download command you use.

    If you will use ~DY command, a extension wil be TTF(when x=T) or TTE(when x=E),

    If you will use ~DU command, a extension wil be FNT.

    Even if you designate a extension by a parameter of a download command, the extension will be set to the mentioned extension in the previous.

    When you will access to a font file stored in a printer, you should designate a actual extension of a font file of a printer.

    The corresponding commans: ^A@, ^CW, ^ID, ^H(Y, ^HW, ^WD
  - Ø When you use a downloaded font,you should set a character code set as needed. In addition, some of character code sets will need a character code conversion table. The Table 3-14 shows combinations of a character code set and a character code conversion table.

Table 3-14 The List of Combinations of a Character Code Set and a Character Code Convesion table

Character code set	^CI command	Character code conversion table d:o.x for ^SE command
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	unnecessary
(deprecated) UTF-8	^CI17^F8	unnecessary
(deprecated, restricted) UTF-16	^CI17	unnecessary
(unusable) UTF-16	^CI29 or ^CI30	-

Our request : Your driver doesn't support UTF-16.

3.22 Display Consumables Information

n Function description:

Ø This function displays information for the consumables equipped in the printer.

² Consumables: Ink cartridges, maintenance box

Ø Displays the latest information for the consumables.

n Use case:

Ø The user checks if there are enough consumables before starting printing.

n Recommendation in achievement:

Ø Display the remaining amount of the ink catridges. (Refer to the UI sample.)

Ø Display the available space of the maintenance box. (Refer to the UI sample.)

n Commands to be used:

Ø ~H(QIQ, ~H(QMN

n UI sample:

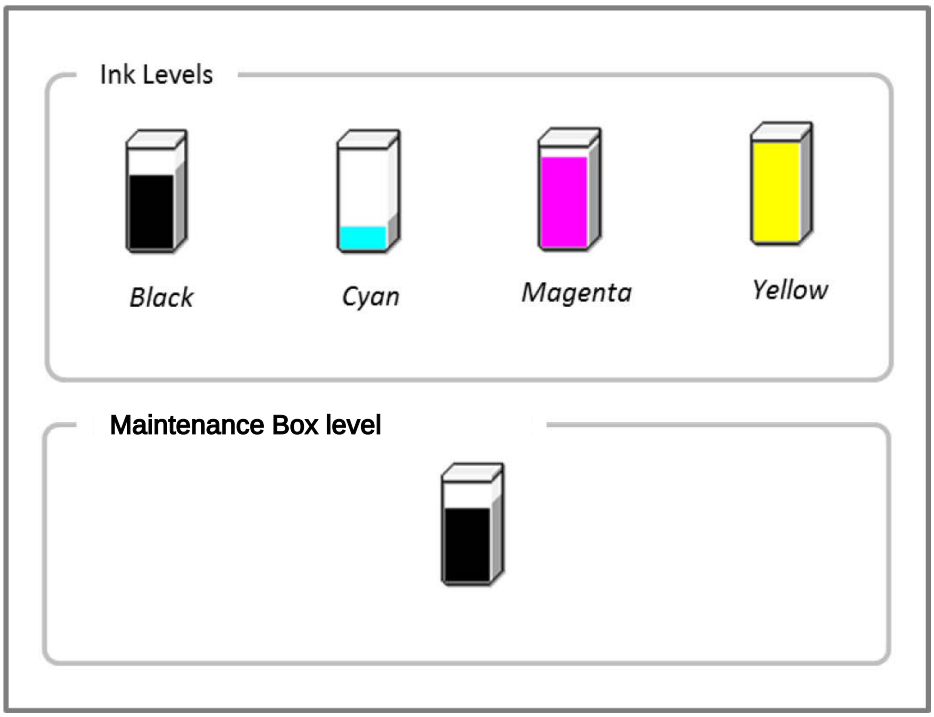
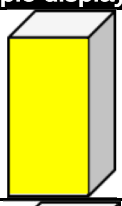
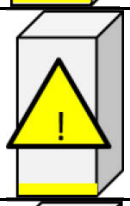
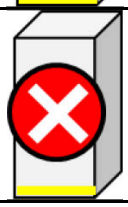
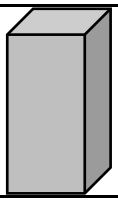


Figure 3-23 UI Sample for the Display Consumables Information

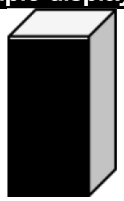
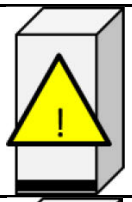
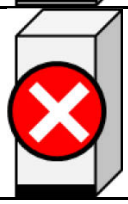
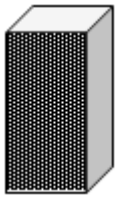
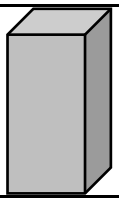
Ø The amount of remaining ink is shown for the cartridges of each color. Depending on the situation, they may be displayed in the following ways.

Table 3-15 Ink Cartridge Display List

Ink status	Example display	Note
Enough ink in cartridge.:RH Moderate ink in cartridge.:RM Small ink in cartridge.:RL		- It must display the image that remain a detected amount of ink.
Ink cartridge low.:RN		
Replace ink cartridge.:RR		- It must display the image that remain a small amount of ink.
Ink cartridge not installed.:NA		
Ink cartridge installed.:CI		-It means not to be able to detect the remaining ink though the ink cartridge installing has been detected.

Ø The available space in the maintenance box is displayed in black. The black area decreases as the available space decreases. Depending on the situation, it may be displayed in the following ways.

Table 3-16 Maintenance Box Display List

Ink status	Example display	Note
Enough space in maintenance box.:RH Moderate space in maintenance box.:RM Small space in maintenance box.:RL		- It must display the image that remain a detected amount of space in the maintenance box.
Maintenance box near full.:RN		
Replace maintenance box.:RR		- It must display the image that remain a small amount of space in the maintenance box.
No maintenance box.:NA		
Maintenance box installed.:CI		-It means not to be able to detect the space in the maintenance box though the maintenance box installing has been detected.

n Note:

ØWhat is the maintenance box?

² The maintenance box collects waste ink.

3.23 Head Cleaning

- Function description:
  - This function cleans the head.
  - This automatically checks nozzle clogs and performs head cleaning.
  - Confirm the cleaning result by printing the nozzle check pattern.
- This function is necessary because:
  - Nozzle clogs will occur.
- Use case:
  - Use when there are missing dots in the printing result.
- Command to be used:
  - ~J(C

3.24 Print Nozzle Clogging Check Pattern

- Function description:
  - The function prints the pattern for checking nozzle clogs
- This function is necessary because:
  - To check if there is no nozle clogs by printing the pattern for checking nozzle clogs.
- Use case:
  - Check that nozzle clogs are not occuring before printing labels.
- Command to be used:
  - ~W(PNC

4 Notes on Communication

4.1 DeviceID

- Description:
  - The DeviceID is as follows.
    MFG:EPSON;
    MDL:TM-C7500[1]
    CLS:PRINTER;

4.2 String Descriptor

- Description:
  - The String Descriptor is as follows.
    idVendor = 04B8H
    idProduct = 0E19H

    iManufacturer ="EPSON“
    iProduct ="TM-C7500"[2]

4.3 Receiving Buffer Full Control

- Description:
  - Due to color printing, the amount of data that the printer receives increases, and the receiving buffer is likely to become full.
  - When the receiving buffer is full, the printer cannot receive data.
  - Because the printer cannot receive data when the receiving buffer is full, the status cannot be got with the status command.
  - The printer receives data even during an error.
  - The receiving buffer may become full if the printer continues to receive data during an error.
- Recommended control:
  - When registering a graphic in the printer, get the available space on the drive using the printer information request command (get available space information on the drive).
  - If there is enough available space for the size of the graphic you want to register, send the data.
  - Get the receiving buffer full status using the printer information request command (get buffer full status information).
  - If the buffer full status is not receiving buffer full, send data that is 4096 bytes or less.
- Commands to be used:
  - ~H(SDS,R, ~H(SPB,F

[1]The characters since "TM-C75" is different depending on the model of the TM-C7500 series.
[2]The characters since "TM-C75" is different depending on the model of the TM-C7500 series.

4.4 Notes If Using Printer Information request Command

- Description:
  - When getting two or more printer information, you can send the printer information request commands together as one command group.
- Recommended control:
  - When sending commands together as one command group, after all the received printer information is confirmed, then send the next command group.
  - If the time out is necessary, set 10 sec or more per one command.
- Command to be used:
  - ~H(C,~H(I,~H(Q,~H(S

4.5 Notes if Using Commands that Request Resonse from the Printer

- Description:
  - If you continue to send “Commands that request status” or “Commands that request printer information” after you sent “Command that request response from the printer”, the response might not be able to be received.
- Recommended control:
  - After the response to “Command that request response from the printer” is confirmed, then send the next “Command that requests status” or “Commands that request printer information”.
- Commands that request response from the printer:
  - ^HF,^HG ^HH,^HW,^HY
- Commands that request status:
  - ~HI,~HM,~HS
- Commands that request printer iformation:
  - ~H(C,~H(I,~H(Q,~H(S

4.6 Notes If Using USB and Network Interface Together

n Description:

- ØThe printer processes data from the interface that received the data first.
- ØWhen the printer is processing data received via USB, it will only receive data from the USB. (USB is selected.)
- ØWhen the printer is processing data received via the network, it will only receive data from the network. (Network is selected.)
- ØWhen USB is selected, once the printer completes processing the data received via the USB, after 10 seconds have passed, the printer becomes able to receive data from the network.
- ØWhen network is selected, once the printer completes processing the data received via the network, the printer immediately becomes able to receive data from the USB.

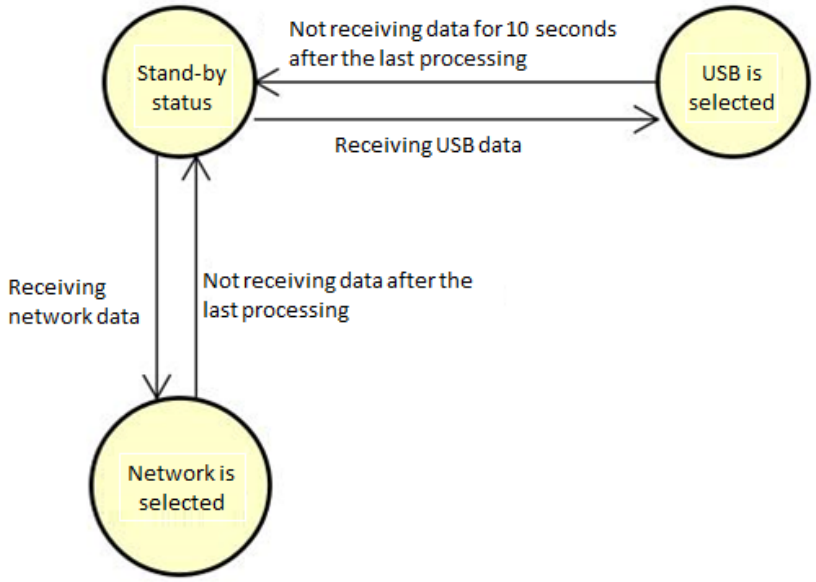


Figure 4-1 Selection of interface

4.7 Printing Cancel

n Description:

- ØIf a spooler cancel is performed or the network cable was pulled to cancel printing, unnecessary data is left in the printer, and the user may not be able to send any further data.
- ØTo delete unnecessary data, the user must perform a full format cancel using the printer's cancel button.

n Recommended control:

- ØPlease suggest users performing a full format cancel using the printer's cancel button if they want to cancel printing.

5 How to print labels efficiently

5.1 Outline

This section describes how to print labels efficiently.
The print performance can be improved by applying the method that mentioned here.

5.1.1 Definition of Term

Label format

Label format means a unit of commands for label printing and a image drawn by the unit of commands. The unit of commands is began by ^XA,and completed by ^XZ.

At least one field is included in a label format involving printing.

Field

Field means a command unit which places a object(such as text, graphic, bar code(symbol), and drawing-diagram) and a image of each object drawn by the command unit.

Fixed-Field, Variable-Ffield

When plural labels are printed by batch, fields which a label format include can be divided into fields which become different print result in the labels and fields which become same print result in the labels.

The former is called a fixed-field and the latter is called a variable-field.

At least of a field is included in a label format involving printing.The including fields are either fixed-field or variable-field, or both of them.

Drawing canvas

Drawing canvas means memory that image of label format for print is drawn to. This memory is gotten inside the printer.

This memory is gotten at each label format. Fields of each label format is drawn to it.

5.1.2 Points for Efficient Label Printing

The points of efficient label printing is the following.

- Ø Using the method of saving and loading a image of the drawing canvas
  Command to be used ^C(D, ^C(L, ^C(S (Refer to ESC/Label Command Reference Guide.)
- Ø Drawing a label format in order of a fixed-field, a variable-field.
  At first, you should save a image of the drawing canvas that only fixed-fields have been drawn to.
  When drawing a image of each format, you should load the saved image, and then draw variable-fields to a format.
- Ø Drawing to the drawing canvas the largest graphic first.
  The printer processes transparent color of image by its own drawing process. However, in case of first graphic of a format, the printer can reduce a process of transparent color.

5.2 Procedure

This section explains the procedure of implementation of the point with practical example. The outline of the procedure is shown here.

Step1. Divide the Fields of the Label Format into Fixed-Fields and Variable-Fields.
Step2. Delete the Image of the Drawing Canvas in the Setting Commands for Each Print
Step3. Save Graphics of Fixed Grapic Fields in the Commands for Saving Graphics
Step4. Print commands
    Save the image of the drawing-canvas which Includes only fixed-field.
    Draw and print first label format.
    Draw and print label formats since the second.
Step5. Commands

The following sections explain details of each step.

5.2.1 Example of Label to Print

The Figure 5-1 shows the label printing by this practical example.
The label has fixed-fields and variable-fields.

Figure 5-1 Sample Label

5.2.2 Divide the Fields of the Label Format into Fixed-Fields and Variable-Fields.

Divide the fields of the label format into fixed-fields and variable-fields.
The Figure 5-2 and Table 5-1show devided result of the practical example.

Figure 5-2 Divided Result of the Sample Label into Fixed-Fields and Variable-Fields

Table 5-1 Divided Result of the Sample Label into Fixed-Fields and Variable-Fields

Name of Field	Category of Field	Type of Field	Number of Figure 5-2
FXGR**	Fixed	Fixed-Graphic	01 to 04
FXTX**	Fixed	Fixed-Text(printer font)	01 to 11
FXBC**	Fixed	Fixed-Barcode(Symbol)	none
FXDR**	Fixed	Fixed-Drawing -Diagram	none
VRGR**	Variable	Variable-Graphic	01
VRTX**	Variable	Variable-Text(printer font)	01 to 02
VRBC**	Variable	Variable-Barcode(Symbol)	01
VRDR**	Variable	Variable-Drawing-Diagram	none

In this practical example, you can use drawing-diagram instead of graphic to FXGR03 and FXGR04.

Text field means that printer font (include downloaded font) is used. If text is sent to printer by graphic commands, it is a graphic field.

5.2.3 Delete the Image of the Drawing Canvas in the Setting Commands for Each Print

Add the command (deleting the saved image of the drawing canvas) to the setting commands for each print mentioned at the section 2.3.2.

Coomand to be used
^C(D Delete the image of the drawing canvas saved temporarily

-Example comands

[Setting commands for each print]	
^XA	Begins label format.
^IDR:*.*^FS	Delete the files that remain in the printer.
^S(CLR,R,600	Sets the format base in dots per inch to 600 [dpi].
^S(CLR,P,600	Sets the print resolution to 600 [dpi].
^S(CLM,T,M1	Sets the media coating type to Matte1.
^S(CLM,F,DL	Sets the media form to Die-cut Label.
^S(CLM,P,IR	Sets the media source to internal roll.
^S(CLM,S,RP	Sets the media shape to roll paper.
^S(CLM,D,M	Sets the detection method to Black mark detection.
^S(CLS,P,2551	Sets the label width to 2551 [dot].
^S(CLS,L,3600	Sets the label length to 3600 [dot].
^S(CLS,G,47	Sets the left gap to 47 [dot].
^S(CLW,T,35	Sets the top margin to 1.5[mm].
^S(CLW,B,35	Sets the bottom margin to 1.5[mm].
^S(CLW,L,35	Sets the left margin to 1.5[mm].
^S(CLW,R,35	Sets the right margin to 1.5[mm].
^S(CPC,E,D	Sets the feather edges function to be not performed.
^S(CPC,C,N	Sets the color correction mode to EPSON Preferred Color.
^S(CPC,D,0	Sets the ink profile and brightne adjustment to 0.
^S(CPC,P,0	Sets the ratio of black to composite setting to 0.
^S(CPC,B,0	Sets the banding reduction to 0.
^S(CBW,C,0	Sets the bar width adjustment to 0.
^S(CMP,F,2	Sets the flush onto paper mode to 2.
^S(CMP,S,12	Sets the printing speed to 12 [inch/sec].
^S(CMP,M,C	Sets the printer operation mode to cutter.
^S(CLE,M,10	Adjusts the label left edge position to left 10[dot].
^S(CLE,T,12	Adjusts the label leading edge position to upper 12[dot].
^C(D	**Dletes the image of the drawing canvas.**
^XZ	Ends label format.

5.2.4 Save Graphics of Fixed Grapic Fields in the Commands for Saving Graphics

Save graphics as shown by the section 2.3.2.
At here, you should download graphics data of fixed graphic fields.
And at here or between the print commands of each label, you can download graphic data of variable-graphic fields. In this example, graphic data of variable-graphic-field is downloaded between the print commands of each label.

-Example comands

[Commands for saving graphics]	
~DYR:FXGR01,B,P,.....	Saves FXGR01.PNG in the R drive.
~DYR:FXGR02,B,P,.....	Saves FXGR02.PNG in the R drive.
~DYR:FXGR03,B,P,.....	Saves FXGR03.PNG in the R drive.
~DYR:FXGR04,B,P,.....	Saves FXGR04.PNG in the R drive.

Note:The notation of the above-mentioned commands has omitted to specify the number of graphic data and the data.

5.2.5 Print commands

5.2.5.1 Save the Image of the Drawing-Canvas which Includes Only Fixed-Field

You should make a label format which include only fixed-fields, and should temporarily save a image of the drawing-canvas.

The image temporarily saved is used as the fixed image at the following.

-Procedure

At beginning of the label format, draw FXGR02 which is the largest fixed-graphic-field, and after that, draw other fixed-field.

Draw all fixed-fields , and save temporarily the image of the drawing-canvas using ^C(S command.

Specify the parameter "p"(print image after saving) of ^C(S command to "N"(No).

-Command to be used

^C(S*p* Save image of drawing canvas temporarily

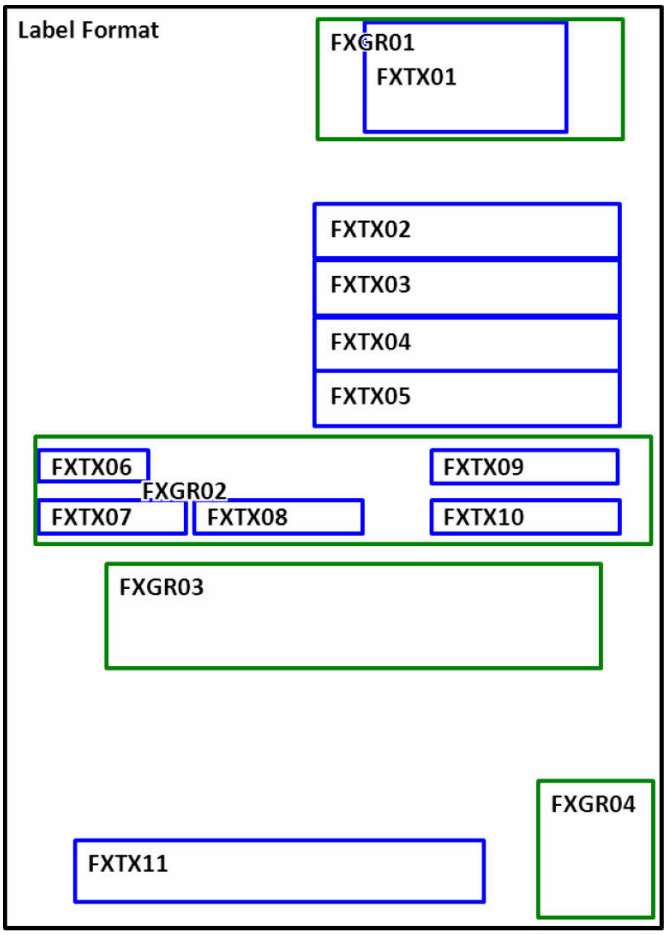


Figure 5-3 Label Format which Include Only Fixed-Field

-Example comands

[Print commands]	
^XA	Begins label format.
< Rendering commands >	
<Fixed-field>	
^FT107,1842	
^IMR:FXGR02.PNG^FS	Draw FXGR02.PNG.
^FT1174,280	(the largest graphic of fixed-graphic-field)
^IMR:FXGR01.PNG^FS	Draw FXGR01.PNG.
^FT376,2324	
^IMR:FXGR03.PNG^FS	Draw FXGR03.PNG.
^FT2062,3437	
^IMR:FXGR04.PNG^FS	Draw FXGR04.PNG.
^FT1410,237^A0N,183,187	Draw FXTX01.
^F(C0,0,255,255,D,255,255,255,0,D^FH¥	
^FDKotobuki^FS	
^FT1430,470^A0N,183,187	
^F(C0,0,255,255,D,255,255,255,0,D^FH¥	
^FDFood^FS	
^FT1181,932^A0N,150,153	Draw FXTX02.
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDABCDEFGHIJK^FS	
	Drawing FXTX03 to FXTX08 is omitted.
^FT1630,1982^A0N,100,101	Draw FXTX09.
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDFlavor : Tomato^FS	
^FT285,3257^A0N,92,94	Draw FXTX10.
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FD2070 Kotobuki-Koaka, Matsumoto,^FS	
^FT285,3374^A0N,92,94	
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDNagano, 399-8702, JAPAN^FS	
^C(SN	**Save the image of the drawing canvas. (without pirnting)**
^XZ	Ends label format.

The image of Figure 5-4 is temporarily saved by the above-mentioned commands.

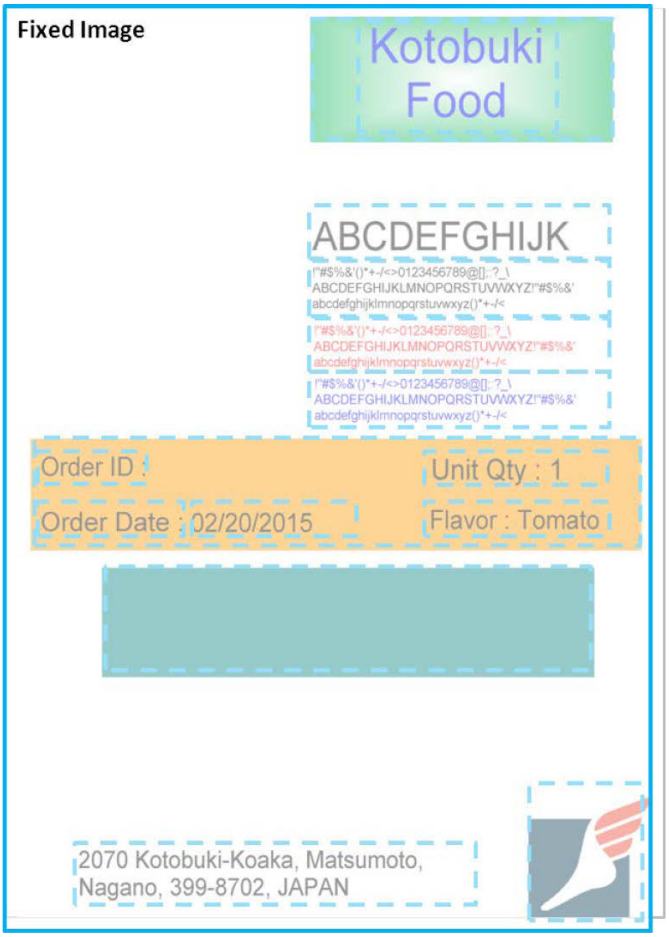


Figure 5-4 The Fixed Image Saved Temporarily

5.2.5.2 Draw and Print first label format

Draw and print first label format by the following procedure.

-Procedure
Download variable-graphic-field.
At beginning of the label format, load(draw) the fixed image saved temporarily.
And then, draw variable-fields.

-Command to be used
^C(L Load temporary saved image of drawing canvas

-Example comands

[Commands for saving graphics]	
~DYR:VRGR01,B,P,.....	Saves VRGR01.PNG(for 1st label) in the R drive.

[Print commands(continued)]	
^XA	Begins label format.
<Fixed-field>	
^C(L	Loads fixed image
<Variabl-field>	
^FT81,545	
^IMR:VRGR01.PNG^FS	Draws VRGR01.PNG(for 1st label)
^FT741,1784^A0N,100,101	
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDABC-0001-DEF^FS	Draws VRTX01(for 1st label)
^FT441,2406^A0N,233,236	
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDABC-0001-DEF^FS	Draws VRTX02(for 1st label)
^FT651,3073^BY9,3,403^BCN,,Y,N	
^F(C0,0,0,255,D,255,255,255,0,D	
^FD>:ABC>50001>6DEF^FS	Draws VRBC01(for 1st label)
< Post-print operation commands >	
^S(CUB,S,N	Sets for the buzzer not to sound after printing is completed.
^PQ1,1	Sets to pause printer after printing is completed.
^XZ	Ends label format.

The image of Figure 5-5 is printed by the above-mentioned commands.

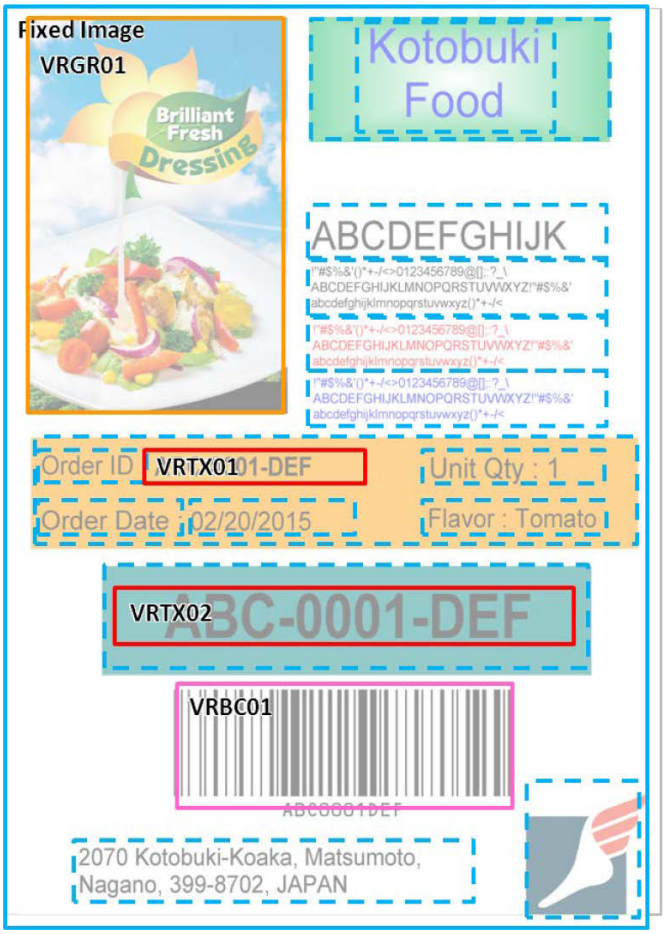


Figure 5-5 Drawing Image of Label Format

5.2.5.1 Draw and Print Label Formats Since the Second

Draw and print label formats since the second.
Repeat this procedure for necessary number of labels.

-Procedure
Download variable-graphic-field.
At beginning of the label format, load(draw) the fixed image saved temporarily.
And then, draw variable-fields.

-Command to be used
^C(L Load temporary saved image of drawing canvas

-Example comands

[Commands for saving graphics]	
~DYR:VRGR01,B,P,.....	Saves VRGR01.PNG(for 2nd label) in the R drive.

VRGR01.PNG is overwritten to graphic of 2nd label.

[Print commands(continued)]	
^XA	Begins label format.
<Fixed-field>	
^C(L	Loads fixed image
<Variabl-field>	
^FT81,545	
^IMR:VRGR01.PNG^FS	Draws VRGR01.PNG(for 2nd label)
^FT741,1784^A0N,100,101	
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDABC-0002-DEF^FS	Draws VRTX01(for 2nd label)
^FT441,2406^A0N,233,236	
^F(C0,0,0,255,D,255,255,255,0,D^FH¥	
^FDABC-0002-DEF^FS	Draws VRTX02(for 2nd label)
^FT651,3073^BY9,3,403^BCN,,Y,N	
^F(C0,0,0,255,D,255,255,255,0,D	
^FD>:ABC>50002>6DEF^FS	Draws VRBC01(for 2nd label)
< Post-print operation commands >	
^S(CUB,S,N	Sets for the buzzer not to sound after printing is completed.
^PQ1,1	Sets to pause printer after printing is completed.
^XZ	Ends label format.

In the practical example, each label format includes loading a fixed image and drawing variable-fields.

You can change this procedure to procedure that load a format file which includes loading a fixed image and drawing variable-fields at beginning of a label format.

Moreover, in the practical example, one label format can print only one sheet of label, because this label format has variable-graphic-field.

If a label format doesn't have variable-graphic-filed,you can print plural labels in one label format by using sequential number commands(^SN, ^SF).

5.2.6 Print Termination Commands

The print termination commands is as showing by the section 2.3.2.

-Example comands

[Print termination commands]	
^XA	Begins label format.
^IDR:*.*^FS	Delete the files registered for the print.
^XZ	Ends label format.

6 Paper Feed Adjustment

The paper feed adjustment is the method to adjust position of CMYK ink shot onto label.

When the label printer feeds paper, paper slips slightly. The slipping is factor that ink position of each color of CMYK shot onto label by print head is out of alignment, and is a one of the items that need to adjust. When the adjustment is inapposite, print quality will decrease.

The slipping has two factors. The factors are aging of printer, and variation of specification of label. The former is adjusted using a application tool providing by EPSON, and the latter is adjusted by the paper feed adjusted value that is input by panel operation or printer driver.

This document explains the method of the paper feed adjustment to adjust the slipping that a variation of specification of label to use is the factor of.

You should develop the printer driver that can enforce the method explained in this section.

6.1 Type of the Paper Feed Adjustment

EPSON's label printer is adjusted based on EPSON standard label at the factory shipment,and at operation, should be adjusted on a label of using.

The label type and the method of the paper feed adjustment of TM-C7500 series are shown in Table 6-1.

Table 6-1 Label Type and Medhod of Paper Feed Adjustment

Label Type	Media Coating Type	Method of Paper Feed Adjustment(Refer to)	Description
EPSON genuine	Plain1 Matte1 Matte2 Synthetic1 Glossy1	Method of Paper Feed Adjustment for EPSON Standard Label(Default Setting)(6.2)	Standard of the paper feed adjustment. The default value is set.
EPSON recommended		Method of Paper Feed Adjustment for EPSON Recommended Label(6.3)	The label recommended by EPSON other than the EPSON genuine label.
others		Method of Paper Feed Adjustment for Other (6.4)	Label that no either the above-mentioned.

Each procedure of method of the paper feed adjustment are explained in the following.

In the explanation of each procedure, the explanation of user interface of printer driver is omitted. Please refer to the section 3 for detail of user interface of printer driver.

6.2 Method of Paper Feed Adjustment for EPSON Standard Label(Default Setting)

In case of the EPSON genuine label,set the paper feed adjustment value to default value.

Step1. Set appropriate settings for using label, and set label to printer(Refer to 6.5.1)
Step2. Set paper feed adjustment value to printer(6.5.2)
Paper feed adjustment value : 0

6.3 Method of Paper Feed Adjustment for EPSON Recommended Label

In case of the EPSON recommended label,set the paper feed adjustment value to the value designated as a part of label specification.

Step1. Set appropriate settings for using label, and set label to printer(Refer to 6.5.1)
Step2. Set paper feed adjustment value to printer(6.5.2)
Paper feed adjustment value : the value designated as part of label specification

6.4 Method of Paper Feed Adjustment for Other Label

In case of other label, the method of the paper feed adjustment is a particular method because the paper feed adjustment value is uncertain.

Step1. Set appropriate settings for using label, and set label to printer(Refer to 6.5.1)
Step2. Print the paper feed adjustment pattern, and confirm the slipping(6.5.3)
Step3. Measure the paper feed adjustment pattern, and calculate the paper feed adjustment value(6.5.4)
Step4. Set paper feed adjustment value to printer(6.5.2)
Paper feed adjustment value : the value calculated at steop 3.
Step5. Confirm the result of setting
Print the paper feed adjustment pattern, and confirm the slipping in a same way as Step2.
If adjustment is necessary, Step3 and 4 are repeated.

6.5 Detail Procedure of Each Step

This section explains detail procedure of each step.

6.5.1 Set appropriate settings for using label, and set label to printer

You should set settings according to a label appropriately to printer.
You can set label setting using panel operation or user interface of printer driver.

A minimum settings that should be done whenever the label type is changed is shown in Table 6-2.

Table 6-2 Minimum Settings For Label Type Changing

Setting Item		Commad
label edge detection		^S(CLM,D
media coating type		^S(CLM,T
media shape		^S(CLM,S
media form		^S(CLM,F
media setting	label width	^S(CLS,P
	left gap	^S(CLS,G
	label length	^S(CLS,L

.

6.5.2 Set paper feed adjustment value to printer

The method of setting the paper feed adjustment value to printer has panel operation of printer or user interface of printer driver.
The operation in case of setting by the panel operation is shown in Table 6-3.

Table 6-3 Panel Operation for Setting Paper Feed Adjustment Value

Panel Operation	LCD displaying after operation
- (before operation)	READY
"Menu", "▼" 2 times	PRINTER SETUP 1
"OK", "▼" 17 times	PAPER FEED ADJUSTMENT
"OK"	+**[pixel] or -**[pixel] (+99 to -99 in TM-C7500 series)
"▲" or "▼"	▲:increasing value, ▼:decreasing value
"OK"	CHANGE SUCCEED

Please refer to the section 3.20 when setting it by the user interface of the printer driver.

6.5.3 Print the paper feed adjustment pattern, and confirm the slipping

Confirm the situation of the slipping by a current paper feed adjustment value.
The slipping is confirmed by printing, and watching the paper feed adjustment pattern.

In TM-C7500 series, the paper feed adjustment pattern is printed by the panel operation shown in Table 6-4.

Table 6-4 Panel Operation for Printing the Paper Feed Adjustment Pattern

Panel Operation	LCD displaying after operation
- (before operation)	READY
"Menu", "▼" 2 times	PRINTER SETUP 1
"OK", "▼" 18 times	PAPER FEED ADJUSTMENT PATTERN
"OK"	>PRINT? YES
"OK"	PRINTING

Confirm print result of printed paper feed adjustment pattern, and complete adjustment if printed paper feed adjustment pattern is appropriate state shown in Figure 6-1.

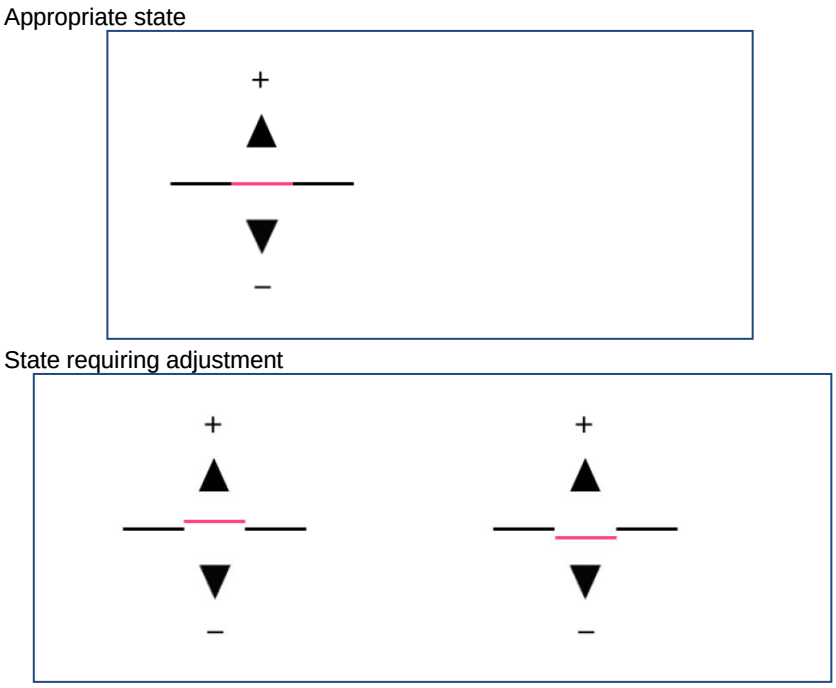


Figure 6-1 Print Result of Paper Feed Adjustment Pattern

6.5.4 Measure the paper feed adjustment pattern, and calculate the paper feed adjustment value

Calculate the paper feed adjustment value by the following procedure.

Place the paper feed adjustment pattern in direction of Figure 6-1('+' is placed upper, '-' is placed lower).

Measure the distance A between black line and magenta line.

Distance A becomes a plus value when the magenta line is placed lower than the black line, and becomes a minus value when the magenta line is placed upper than the black line.(Figure 6-2)

Figure 6-2 Measuring a Distance Between Blak Line and Magenta Line

Calculate the paper feed adjustment value from the distance A by the following expression.

Calculation by millimeter unit

Papaer feed adjustment value = Current adjustment value + A[mm]/25.4×1200

Calculation by inch unit

Papaer feed adjustment value = Current adjustment value + A[inch]×1200

7 Control of Beeper Sounding, Cuts, and Pauses

7.1 Outline

This section describes how to control beeper sounding, cuts, and pauses.

Applying the methods shown here allows you to instruct the printer to sound the beeper, perform a cut, or pause after any label print.

7.1.1 Beeper Sounding and Cuts

The beeper sounding and cut functions use the ^S(C command to issue setting commands to the printer. The user can change these settings freely by operating the panel. If you do not want to use the values set in the printer, we recommend overwriting the settings at the start of each print job.

7.1.2 Pause

The pause function uses the ^PQ or ^PP command to give commands for each label print (^XA-^XZ).

^PQ: Pauses the printer each time it prints a certain number of labels

^PP: Pauses the printer after it prints the final label

7.1.3 Command Parameter Examples

Table 7-1 Command Parameter Examples for Each Function

Function	Command example	Description
Beeper setting	^S(CUB,S,N	Printer does not sound beeper
	^S(CUB,S,L	Printer sounds beeper after printing final label
Cut	^S(CMP,M,T	Printer does not cut labels
	^S(CMP,M,C	Printer cuts labels
Pause	^PQ1	Printer prints 1 label and does not pause
	^PQ1,1	Printer prints 1 label and pauses after printing 1 label
	^PQ3,1	Printer prints 3 labels and pauses after printing 1 label
	^PQ3,3	Printer prints 3 labels and pauses after printing 3 labels
	^PP	Printer prints 1 label and pauses after printing 1 label
	^PQ3^PP	Printer prints 3 labels and pauses after printing 3 labels

7.2 Beeper Sounding

n Function
Sets the buzzer timing setting
n Command code
^S(CUB,S,c
n Parameters
c = N : Printer does not sound the beeper
L : Printer sounds beeper after printing final label

This command sets the printer's beeper sounding operation.
To change the beeper volume, operate the printer panel or use the ^S(CUB,Z command.

Example 1: Printer prints 3 labels then sounds the beeper after printing final label

```
^XA
^S(CUB,S,L                          Sets printer to sound beeper after printing final label
^FO0,0^FDprint 3 pages^FS
^PQ3
^XZ
```

Example 2: Printer prints 3 labels and does not sound the beeper

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

Example 3: Printer prints 2 labels then sounds the beeper after printing final label
If setting whether to sound the beeper for each ^XA-^XZ instance, send commands as follows.

```
^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
```

7.3 Pause

7.3.1 ^PP Command

n Function
Paused
n Command code
^PP

This command pauses the printer after it prints the final label.

Example 1: Printer prints 3 labels then pauses, repeats this 3 times

^XA^S(CMP,M,T^XZ	Sets printer to not cut labels
^XA^FO100,100^FD 1 of 3 ^FS ^PQ3 ^PP ^XZ	Prints 3 labels then pauses
^XA^FO100,100^FD 2 of 3 ^FS ^PQ3 ^PP ^XZ	Prints 3 labels then pauses
^XA^FO100,100^FD 3 of 3 ^FS ^PQ3 ^PP ^XZ	Prints 3 labels then pauses

7.3.2 ^PQ Command

n Function
Set print quantity
n Command code
^PQ t, i, c, p
n Parameters
t = 1 or more Total print quantity
i = 0 or more Printer interval for pauses and cuts
c = 0 or more Serialized label print quantity
p = Y or N Set/cancel pause control

Example 1: Printer pauses each time it prints 3 labels using the ^PQ command parameter i

^XA^S(CMP,M,T^XZ	Sets printer to not cut labels
^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	Prints label then pauses
^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	Prints label then pauses
^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	Prints label then pauses

Example 2: Printer prints 3 labels then pauses, repeats this 3 times

^XA^S(CMP,M,T^XZ	Sets printer to not cut labels
^XA^FO100,100^FD 1 of 3 ^FS ^PQ3,3 ^XZ	Prints 3 labels then pauses
^XA^FO100,100^FD 2 of 3 ^FS ^PQ3,3 ^XZ	Prints 3 labels then pauses
^XA^FO100,100^FD 3 of 3 ^FS ^PQ3,3 ^XZ	Prints 3 labels then pauses

Example 3: Printer prints 9 labels and pauses each time it prints 3 labels

^XA^S(CMP,M,T^XZ	Sets printer to not cut labels
^XA^FO100,100^FD 9 pages ^FS ^PQ9,3 ^XZ	Prints 3 labels then pauses

7.4 Cut

7.4.1 ^S(CMP,M Command

n Function
Print operation mode settings
n Command code
S(CMP,M,c
n Parameters
c = T Teer-off mode
C Cutter mode

This command sets the print operation mode.
If the printer is set to cutter mode, it cuts the labels at the following timing.

- Timing specified by parameter i of the ^PQ command
- Timing when the final label is printed

Example 1: Printer prints 1 label then cuts

^XA	
^S(CMP,M,C	Sets printer to cut
^FO100,100^FD 1 of 1^FS	Prints label
^XZ	

Example 2: Printer prints 3 labels and cuts and pauses for each label

^XA	
^S(CMP,M,C	Sets printer to cut
^FO100,100^FD 3 pages^FS	
^PQ3,1	Sets printer to print 3 labels, and cut and pause for each label
^XZ	

Example 3: Printer prints 3 labels and cuts for each label but does not pause

^XA	
^S(CMP,M,C	Sets printer to cut
^FO100,100^FD 3 pages^FS	
^PQ3,1,,Y	Sets printer to print 3 labels, and cut for each label but not to pause
^XZ	

7.5 Example of Combining Cutting and Pausing

This section describes sample code for cutting labels then pausing, operating as shown below.

Table 7-2 Cut and Pause Operation for the Sample Code

Operation timing	Cut	Pause
After printing 3rd label	Performed	Performed
After printing 6th label	Not performed	Performed
After printing 9th label	Performed	Not performed
After printing other labels	Not performed	Not performed

Example 1: Printer prints 1 label then performs a cut and pause for each ^XA-^XZ instance

```
^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        Cuts and pauses
^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              Pauses
^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        Cuts
```

Example 2: Printer prints 3 labels then performs a cut and pause for each ^XA-^XZ instance

```
^XA^S(CMP,M,C^FO100,100^FD1 of 9^SFd^FS ^PQ3^PP^XZ      Prints 3 labels then
                                                        cuts and pauses
^XA^S(CMP,M,T^FO100,100^FD4 of 9^SFd^FS ^PQ3^PP^XZ      Prints 3 labels then pauses

^XA^S(CMP,M,C^FO100,100^FD7 of 9^SFd^FS ^PQ3^XZ         Prints 3 labels then cuts
```