SATO EUROPE

SATO BARCODE PROGRAMMING LANGUAGE

For Enhanced Printer Models

Issued February 2001

Thank you for purchasing a SATO product.

This manual describes the instructions of control commands when labels are issued by a SATO printer.

Please read the manual that comes with the printer before using the printer.

February 2001
SATO

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1. Overview

1.1 About SBPL

SBPL (Sato Barcode Programming Language) is a common command that controls the Sato barcode printer.

By using SBPL, you can control characters, the system, and communications with the printer from your computer.

First, you should understand what SBPL is all about.

1.2 About this manual

The following is the composition and description of the SBPL manual:

(1) Overview
This section explains the overview of SBPL and the label differences for each printer model

(2) Basic command reference
This section explains the print control command and the system control command

(3) Two dimension command reference
This section explains the two-dimension code print control command.

(4) Interface
This section explains RC-232C, centronics, High-speed RS-232C, IEEE1284, LAN, USB external signal specification and communication control.

(5) Option
This section explains option commands (memory card). This is effective when the printer has options.

1.3   Command Composition

When you use a barcode label printer, you can print as much as expected by combining multiple SBPL commands. This command is an instruction that sends characters to a printer and sets the action. SBPL consists of many command types. You can see the following description of SBPL command in the manuals such as the Basic Command Reference.

<u><XM></u>   <u>PRINT</u>
Command   Contents of print

<XM> is the escape sequence sent to the barcode printer. The escape sequence is a string of the escape character (ESC) placed in the header and represented by the hex value 1B(H). The following is a comparison between the command representation and the escape sequence.
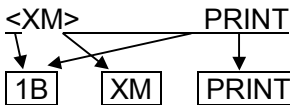
In other words, you can replace the < > with an escape character.

The following is a sample program that shows the escape sequence was sent.

In this example, the printer and computer are connected to the RS-232C and the programming language is BASIC.

Command with print contents:

10 ESC$=CHR$ (&H1B);
20 PRINT #1, CHR$ (&H2);
30 PRINT #1, ESC$; "A";
40 PRINT #1, ESC$; "V100"; ESC$; "H100";
50 PRINT #1, ESC$; "L0202"; ESC$; "P2";
40 PRINT #1, ESC$; "XMPRINT";
50 PRINT #1, ESC$; "Z";
60 PRINT #1, CHR$ (&H3);

When each SBPL command is sent in the above mentioned format, the printer analyzes the contents of the command and prints.

1.4 Conventional Command Structure

(1) Header, Label size, Number, and Footer Specification

When a command is sent to the barcode label printer, an escape sequence should be composed in the order of Header, Label size, Print, Number, and then Footer Specification.

The following is an example of the above.

Header   `<A>`
Label size   `<A1>`
Print   Each command and print information
Quantity   `<Q>`
Footer   `<Z>`

The image of the command structure is as follows.
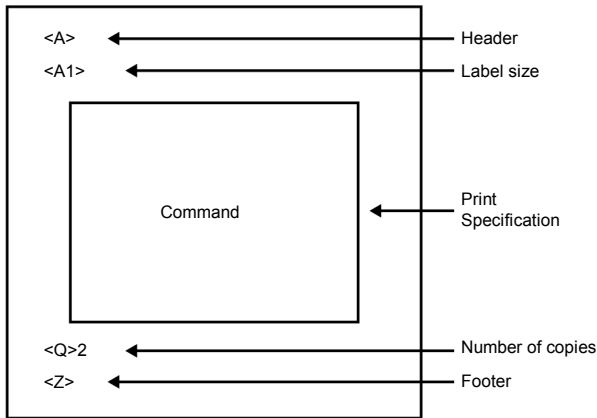
Note:

(1) When a command is send by the RS-232C interface, add `<STX>` before `<A>`, and `<ETX>` after `<Z>`.

(2) `<A1>` is not required but the starting point can be adjusted to the label by specifying it.

(2) Print Specification

The following minimum specifications are required in order to print fields.

- Vertical position
- Horizontal position
- Font or barcode
- Print information (character pitch and scale specification may be combined)

The following are specific commands.

- Vertical margin   <H>
- Horizontal margin   <V>
- Font or barcode   Each character command (each barcode command)

Therefore, the following command structure is combined into one set of commands.

<V>100	←	Vertical 100 dots
<H>200	←	Horizontal 200 dots
<XM> Font	←	XM
PRINT	←	Print information

For more information about commands, refer to the "Basic Command Reference".

1.5 Target Printer Models

CL408e/CL412e
M-8400RVe
CL608e/CL612e
CT400DT/CT410DT
CT400TT/CT410TT
M8485Se/M8490Se/M8460Se/M8459Se

SBPL commands basically apply to all printer models. However, there are some differences in printer resolution (head density), maximum print area (width/height), label setting position, print speed, and some font size (OA, OB) because these depend on a hardware. Please check with the following table.

	Printer Model	Print Resolution (Head Density)	Max Print Area				Label Set Position	Print Speed (inch/sec)
			Width	Standard Height	Extended Height AX	Extended Height EX		
1	CL408e	203dpi (8dot/mm)	104mm (832dot)	178mm (1424dot)	356mm (2848dot)	1249mm (9999dot)	End	2,3,4,5,6
2	CL412e	300dpi (12dot/mm)	104mm (1248dot)	178mm (2136dot)	356mm (4272dot)	833mm (9999dot)	End	2,3,4,5,6
3	M-8400RVe	203dpi (8dot/mm)	104mm (832dot)	178mm (1424dot)	356mm (2848dot)	1249mm (9999dot)	End	2,4,6,8,10
4	CL608e	203dpi (8dot/mm)	152mm (1216dot)	178mm (1888dot)	356mm (2848dot)	1249mm (9999dot)	End	4,6,8
5	CL612e	300dpi (12dot/mm)	165mm (1984dot)	178mm (2136dot)	356mm (4272dot)	833mm (9999dot)	End	4,6,8
6	CT400 DT/TT	203dpi (8dot/mm)	104mm (832dot)	400mm (3200dot)			Center	2,3,4,5,6
7	CT410 DT/TT	300dpi (12dot/mm)	104mm (1248dot)	400mm (4800dot)			Center	2,3,4
8	M8485Se	203dpi (8dot/mm)	128mm (1024dot)	178mm (1424dot)	356mm (2848dot)	1249mm (9999dot)	End	4,6,8,10,12
9	M8490Se	300dpi (12dot/mm)	112mm (1344dot)	178mm (2136dot)	356mm (4272dot)	833mm (9999dot)	End	4,6,8
	M8460Se	203dpi (8dot/mm)	152mm (1216dot)	178mm (1424dot)	356mm (2848dot)	1249mm (9999dot)	End	4,6,8
	M8459Se	203dpi (8dot/mm)	112mm (896dot)	178mm (1424dot)	356mm (2848dot)	1249mm (9999dot)	End	2,3,4,5

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2. Basic Commands

2.1 Installation of SBPL

About Basic Command Reference

This manual describes the function and format of the SBPL commands.

As the SBPL manual explains, SBPL is a common command to control the SATO barcode label printer.

This manual describes the commands to create a format and print a label/tag, function and meaning of the command, command format and parameter, and additional information and cautions.

SBPL (Sato Barcode Programming Language)

SBPL (Sato Barcode Programming Language) is a high level printer control language used to define the label format and label printing process.

This makes it possible to send SBPL commands to the printer and print many different types of label/tags from simple to complicated types.

For example, by combining multiple SBPL commands, not only can various fonts, character, barcodes and graphics be defined but it also possible to extend to command of fonts, lines, and inversion of Black/White printing.

The SBPL commands have powerful and flexible language functions and provide the following functions:

- Print control of many types of graphic formats
- Sequential field creation that allows to define the increase/decrease calculation
- Outline font specification
- Compatibility with PC networks
- Return the Printer Status Information

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2.2 Overview of SBPL

Format Command

A Format Command is the print design information of the label/ tag to be printed by the barcode label printer.

The label printer does not have the concept of column or line, which is different from a serial printer. Therefore, free print designs can be created within the print effective area.

There are format commands to create such print design.

The format command includes information such as label size, starting field position to be printed and the type of field (character, barcode, lines and graphics).

For more information about these commands, refer to the "Command Reference".

Regulation of Escape Sequence and Syntax

Except for some commands, assemble an "Escape Sequence", which combines an escape (<>) and command, and create data to be sent to the printer. An escape sequence is a string that an escape character (ESC) is placed at the top with an escape character that is a hex value 1B(H).

SBPL Font

The SATO printer installs 12 types of bitmap fonts and one outline font by default.

The size and density of the font depends on the printer head density.

Selection of Font

When you use the fonts installed, specify ESC+ (Font Type Command).

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Font Command	Matrix WXH (dot)	Type	Pitch
OA (8 dots)	15 x 22	OCR-A Font Specification	Fixed
OB (8 dots)	20 x 24	OCR-B Font Specification	Fixed
OA (12 dots)	22 x 33	OCR-A Font Specification	Fixed
OB (12 dots)	30 x 36	OCR-B Font Specification	Fixed
XU	5 x 9	XU Font Specification	Fixed
XS	17 x 17	XS Font Specification	Fixed/Proportional
XM	24 x 24	XM Font Specification	Fixed/Proportional
XB	48 x 48	XB Font Specification	Fixed/Proportional
XL	48 x 48	XL Font Specification	Fixed/Proportional
U	5 x 9	U Font Specification	Fixed
S	8 x 15	S Font Specification	Fixed
M	13 x 20	M Font Specification	Fixed
WB	18 x 30	WB Font Specification	Fixed
WL	28 x 52	WL Font Specification	Fixed

Enlarge Font

The fonts installed can be enlarged up to 12x.

Bitmap and outline fonts can be downloaded and added to the printer.

The internal bitmap fonts can be enlarged from the basic size to 12x. For example, when the basic size font is 5 (W) x 9 (H) dot and it is enlarged by 3x, it will be 15 (W) x 27 (H) dot.

The following is the parameter setting of character height x enlargement and width x enlargement ratio to be printed.

Width x Enlargement ratio = the setting value of width parameter

Height x Enlargement ratio = the setting value of height parameter

The Enlargement Specification command (<L>) controls the size of enlargement. This parameter is specified by amplification.

For example, if <L>0304 is specified, the font is enlarged by 3x in the horizontal direction and 4x in the vertical direction.

If the Enlargement Specification command is specified, the character pitch is also enlarged.

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Fixed Pitch and Proportional Pitch

For XS - XL fonts, either the fixed or the proportional pitch printing can be selected.

The specification of the pitch mode can be set by the Proportional Specification <PS> command, the Proportional Pitch Cancel <PR> command, or the user mode of the printer LCD.

The size of the proportional pitch varies depending on the font type. Katakana does not influence the proportional pitch. However, if you specify the proportional pitch, the space between alphanumerics will be smaller.

For the fixed pitch, specify the pitch width that is specified for all fonts.

Difference between Outline Font and Bitmap Font

The Bitmap font is installed in the printer at a fixed height and width size. In fact, the height of the Bitmap font is slightly larger than the width.

The Bitmap font is the maximum size of the font matrix. For the font types and size, refer to the previous section "Selection of Font".

For outline fonts, if you set the height and width equally, a well-balanced font can be generated by using the Smooth Scaling Algorithm function of the printer. In addition, many font styles such as character decoration, reverse plate, shadow, and italics can be selected.

Basic Concept of SBPL

By understanding SBPL, its concepts and terms, you will be able to increase your knowledge of SBPL.

Character Rotation

A character can be rotated by 90 degrees in the label feeding direction. The start print position should be specified as shown in the figure below.

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90 degrees character rotation


```
<A>
<%>1
<V>800<H>200
<L>0202
<P>02
<XM>ABC
<Q>1
<Z>
```
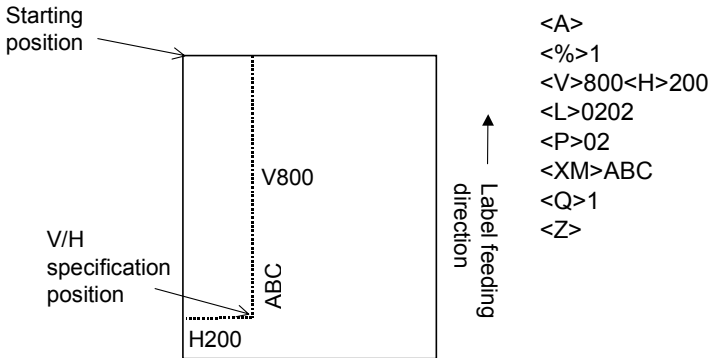
This figure shows the character rotation result and command <%> used.

Since <%>1 is used, a 90 degree rotation printing is executed.

If you use <%>2 or <%>3, you can rotate the character by 180 degrees or 270 degrees.

This specification is effective until you specify another value. If you specify <%>0 (0 degree), you can return the character rotation from the original position.

This command is canceled with <Z> (0 is default).

2.3   SBPL Printer Configuration

The printer is configured via the LCD or Dip Switch (DSW) of the printer. The following switching procedure is not required if you do not wish to change the settings from your PC over a network.

In many cases, the printer can be configured with SBPL commands. When the printer receives the Configuration command, it changes the settings. This is effective until you turn off the printer. When the label is issued the next time, the changes are reflected the settings.

This chapter describes the printer configuration using the SBPL command. The following is a list of Printer Configuration commands.

<#E>   (Print Density): Sets the print density.

<A3>   (Start Position): Sets the start position.

<CS>   (Print Speed): Sets the print speed.

<IG>   (Sensor Selection): Specifies the selection of the transparent sensor or the reflection sensor.

<A1>   (Label Size Setting): Sets the label size.

<TG>   (Space Setting between Labels): Sets the space between labels.

Operation Mode

Specifies the operation mode.

0: Continuous Operation

1: Tear Off Operation

2: Cutter Operation (Head position)

3: Cutter Operation (Cutter position)

4: Cutter Operation (without back feed)

5: Linerless Operation (Cutter position)

6: Linerless Operation (without back feed)

7: Dispenser Operation (Head position)

8: Dispenser Operation (Dispenser position)

You do not have to specify this command for regular label printing.

When you turn off the printer, all specified values are invalid and the registered values in the printer are valid when the printer is restarted.

Printing Type Specification

Specifies the Print type:

1. Thermal Type

2. Direct Thermal Type

You do not have to specify this command for regular label printing.

When you turn off the printer, all specified values are invalid and the registered values in the printer is valid when the printer is restarted.

Print Density Specification

Specify the print density.

Specification of the print density level (can be omitted; default value is 3)

1=Light

2=Medium Light

3=Normal

4=Medium Dark

5=Dark

Specification of print density (can be omitted; default value is A)

C=Light

B

C

E

A

D=Dark

The print density parameter can be specified in six types from "A" to "F" and five types from "Light" to "Dark", which means 30 possible combinations.

The setting varies depending on the type of device. For more information, refer to the Print Density Specification <#E> command.

Start Position Specification

Specifies the start position coordinate.

Specifies the vertical start position correction signal.

    +, -

Specifies the vertical start position correction signal as dot.

    0 - 999

Specifies the horizontal start position correction signal.

    +, -

Specifies the horizontal start position correction signal as dot.

0 - 800

Start Point
before specifying

H V

Start Point
after
specifying
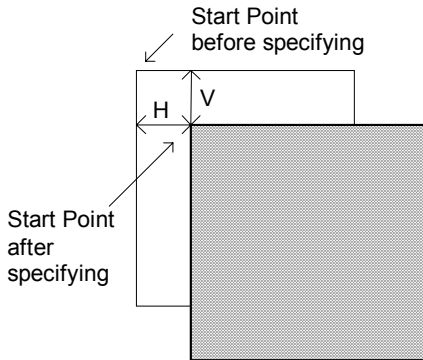
When you turn off the printer, all specified values are invalid.

Sensor Selection

Specifies the sensor type.

Sensor Type Specification (Default: 1)

1. Reflection sensor (Eye mark)

2. Transparent sensor (Space)

3. Sensor not used

You do not have to specify this command for regular label printing.

When you turn off the printer, all specified values are invalid and the registered values in the printer are valid when the printer is restarted.

Save Settings

The <PG> command registers and saves the printer settings into the EEPROM.

The settings to be registered as follows.

„Enhanced" Printers

In general, you should adjust the settings from the User Mode of the printer.

CT400DT/TT & CL410DT/TT

Refer to the User Manual to change the registered values such as Print Speed, Cutter Operation, Dispenser Operation, Linerless Operation, Print Density, Sensor Type, 0 Slash, Label Specification, Initial Feed, Proportional Pitch, Label Size, Start Position Correction Value, Label Pitch, Offset, TearOff Offset, Cutter Offset, Dispenser Offset, Space Size between Labels and Alarm Sound Setting, use the PG command or the "Advanced Printer Setting" option from the Window driver. For details refer to the manual.

2.4   SBPL Command Tutorial

Preface

This tutorial is designed for first-time and experienced SBPL users.

First-time SBPL users should read this tutorial entirely. It is setup in a simple manner so you can become familiar with all sections in a short time.

If you are familiar with some SBPL commands, you can skip to the sections that describe the functions.

Most sections are independent of each other but some sections are prerequisites fors other sections.

Before starting this section, make sure that the label and ribbon are correctly setup in the printer. For more information on setting a label and ribbon, refer to the manual that comes with the printer.

The following label size is specified for this section.

104mm(W) x 178mm(H)

In this section, the printer head density is 8 dot/mm. When you use a 12 dot/mm printer, the print size will be smaller.

You can use another label but you must change the parameter of the Print Data Size Field value.

You can create the program introduced in this section by using any text editor or word processor that can generate an ASCII file.

Note: For this section, use the default settings of the printer unless the tutorial section instructs you to change the settings.

Note: To use the default settings, refer to the manual that comes with the printer.

Tutorial 1. Creating a simple label

In this section, we will discuss how to create a simple label format. We will also learn basic information to create a label for both character and barcode.

SBPL command sent to the printer

<A>

<V>100<H>50<L>0404<XB>1SATO

<V>350<H>100<B>104250*12345*

<V>600<H>150<L>0101<XB> 1*12345*

<Q>1

<Z>

Description of the command

<A>

Shows that data send has started.

<V>100

Specifies the vertical print position to 100 dot below from the start position.

<H>50

Specifies the horizontal print position to 50 dot right from the start position.

<L>0404

Enlarges the character by 4x in the vertical and horizontal direction.

<XB> 1SATO

Print SATO with a font type XB (with smoothing)

<B>1004250*12345*

Prints a CODE39 barcode with Ratio1:3, narrow bar width 4L, barcode top 250 dot. Print information*12345*

<Q>1

Command to print one label.

<Z>

Shows that data transfer is completed.

Execution Result

When the SBPL of this section is sent to the printer, the label is printed as shown in the following figure. If printing fails, confirm that the data to be sent to the printer is identical to the code in this section and try resending the code.

S A T O
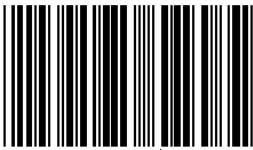
✳1 2 3 4 5✳

Tutorial 2. Printing and Rotating Font

In this section, we will learn about the font types and how to rotate them.

SBPL command sent to the printer

<A>

<%>0

<V>700<H>400<L>0101<XB>0LAB0

<%>1

<V>700<H>400<L>0101<XB>0LAB1

<%>2

<V>700<H>400<L>0101<XB>0LAB2

<%>3

<V>700<H>400<L>0101<XB>0LAB3

<Q>1

<Z>

Description of the command

<%>0

Prints the specified command in the positive direction as shown below.

<%>1

Prints the specified command with a 90 degree rotation as shown below.

<%>2

Prints the specified command with a 180 degree rotation as shown below.

<%>3

Prints the specified command with a 270 degrees rotation as shown below.

<V>700<H>400<XB>0LAB0

Prints LAB0 using an XB font with 700 dots below from the start position and 400 dots to the right (without smoothing)

<Q>1

Specifies the print number to 1

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Execution Result

```
                         ⊢
                       L A B 1
        2 B A ⊣  ⌐|L
              ⌐|L  L A B 0
               A
               B
               3
```

Tutorial 3. Form Overlay Storage and Recall

In this section, we will learn about the necessary information on form overlay storage and recall.

SBPL command to be sent to the printer

\<A>

\<V>100\<H>50\<FW>1010V800H750

\<V>100\<H>50\<FW>0505V760H710

\<V>150\<H>100\<XB>0MODEL

\<&>

\<Z>

\<A>

\</>

\<V>200\<H>100\<P>0\<$>B, 100, 100, 6

\<$=>SATOPRINTER

\<V>720\<H>150\<B>102100*95000012345*

\<Q>1

\<Z>

Description of the command

\<&>

Stores \<A> to \<Z> as the form overlay.

\</>

Recalls the stored overlay.

\<V>200\<H>100\<P>0\<$>B, 100, 100, 6

\<$=>SATOPRINTER

Prints characters "SATOPRINTER" using an outline font (character pitch fixed fonts 100 (W) x 100 (H) dots with reverse plate) at 200 dots from the start position and 100 dots to the right.

\<V>720\<H>150\<B>102100*95000012345*

Prints "95000012345" with a CODE39 barcode (thin bar ratio 2L and 100 dots at the top) 720 dots from the start position and 150 dots to the right.

Execution Result
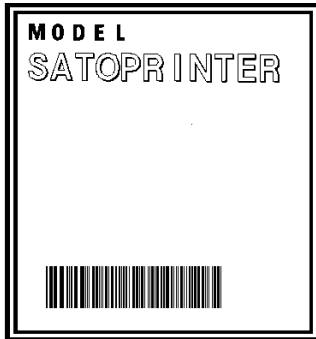
2.5 SBPL Basic Command Reference

Preface

The SBPL Basic Command Reference describes the commands installed in the SBPL printer.

In this chapter, an explanation of the selected command parameters is provided.

A new SBPL is added to the firmware of the new printer and is explained as an application. Refer to the command list and firmware list for more details.

SBPL Basic Command Reference

This section describes the basic commands explained from chapters 1 to 4 and the commands that the printer supports.

ESC+A   Data Send Start Specification

[Function]

Specifies the start sending data.

[Supplement]

01.   Add this command to the top of the data in order to repre-
       sent the start of the block.

02.   Always use this command with the <Z> command that
       represents the end of the data column.

03.   If this command is not specified, printing is not started.

Example of the Data Send Start Specification

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

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ESC+Z   Data Send End Specification

[Function]

Specifies the end sending data.

[Supplement]

01.   Add this command to the end of the data in order to represent the end of the block.

02.   All command settings, except for system commands and some commands, are reset to the default values.

03.   Always use this command with the <A> command that represents the start of the data column.

04.   If this command is not specified, printing will not start.

Example of the Data Send End Specification Command

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

ESC+Q　　Print Quantity Specification

[Function]

Specifies the print quantity.

[Supplement]

01.　　Specify the print number of labels/tags as one page spec-
　　　 ified with <A> - <Z>.

02.　　When there is a field where the consecutive print specifi-
　　　 cation <F> is specified, the print result may be affected by
　　　 the field.

Example of the Print Number Specification Command

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]　<Q>aaaaaa

a　　　"Print Number" = Valid Range: 1-999999

ESC+H   Print Horizontal Position Specification

[Function]

Specifies the horizontal position from the start point with dot.

[Supplement]

01.   Information outside the print range (characters, barcodes, graphics) is not printed.

02.   When you print a character with <%> command a 90 or a 270 degree rotation combined with the line <FW> command or inversion <%> command, the vertical and horizontal value of the specified range will vary.

Example of the Print Horizontal Position Specification Command

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <H>aaaa

a   "Print Horizontal Position Specification" = Valid Range: Refer to the table below

Device Type	Valid Range (dot)
CL408e	1 - 832
CL412e	1 - 1248
M-8400RVe	1 - 832
CL608e	1 - 1216
CL612e	1 - 1984
CT400DT/TT	1 - 832
CT410DT/TT	1 - 1248
M8485Se	1 - 1024
M8490Se	1 - 1344
M8460Se	1 - 1216
M8459Se	1 - 896

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ESC+V   Print Vertical Position Specification

[Function]

Specifies the vertical position from the start point with dot.

[Supplement]

01. Information outside the print range (characters, barcodes, graphics) is not printed.

02. When you print a character with <%> command or a 90 or a 270 degree rotation combined with the line <FW> command or inversion <%> command, the vertical and horizontal value of the specified range will vary.

Example of the Print Vertical Position Specification Command

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <V>aaaa

a   "Print Vertical Position Specification" = Refer to the table below

Device Type	Valid Range (dot)
CL408e	1 - 1424
CL412e	1 - 2136
M-8400RVe	1 - 1424
CL608e	1 - 1424
CL612e	1 - 2136
CT400DT/TT	1 - 3200
CT410DT/TT	1 - 4800
M8485Se	1 - 1424
M8490Se	1 - 2136
M8460Se	1 - 1424
M8459Se	1 - 1424

ESC+P   Character Pitch Specification

[Function]

Specifies the character pitch with dot.

[Supplement]

01.   The character pitch is the space between fonts and characters when a barcode is specified or when there are intervals between characters.

02.   The default value of this command is "02".

03.   The dots are increased according to the enlargement command <L>.

04.   When the Font command is specified, the default value is reset. However, this command does not reset to the default if CR is used as an automatic line feed. It returns to the default with <Z>.

05.   When this command is specified immediately before a barcode specification, the Pitch command becomes effective for the barcode module.
Target barcode: Codabar, CODE39, Industrial 2 of 5, Matrix 2 of 5

06.   If you specify data other than a number or exceed the number of digits, the default value is reset.

Example of the Character Pitch Specification Command

<A>

<V>100<H>200<P>10<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <P>aa

a   "Character Pitch" : Valid Range: 0 - 99 (dot)

ESC+L   Enlargement Specification

[Function]

Specifies the enlargement ratio of the character.

[Supplement]

01.   The default value of this command is "1x" in both vertical and horizontal direction (if there is no specification between <A> - <Z>). The enlargement also applies to the character pitch.

02.   The specified enlargement ratio is maintained until this command is specified again.

03.   Returns to the default with <Z>.

04.   This is effective not only for a character font but also graphics and PCX/BMP file printing.

05.   This is invalid for the barcode specification.

Example of the Enlargement Specification Command

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <L>aabb

a   "Enlargement Ratio in Horizontal Direction":
       Valid Range: 01 - 12

b   "Enlargement Ratio in Vertical Direction":
       Valid Range: 01 - 12

ESC+E   Automatic Line Feed Specification

[Function]

Specifies the line pitch.

[Supplement]

01.   When CR (0DH) is specified, a line feed is given to only the specified pitch.

02.   Effective for the rotation print specification.

03.   The line feed pitch can be changed during the operation.

04.   Specify <E> before specifying a repeat printing of one line.

05.   An automatic line feed is applied as long as the CR (0DH) specification continues. However, it is determined by the pitch specified with this command and <H> specification value after this command. Please note that more than one <H> are specified after this command, the returned position by CR is the last <H> position.

Example of the Automatic Line Feed Specification Command

<A>

<E>10

<V>100<H>200<P>2<L>0304<XM>

ABCDE+CR

FGHIJ+CR

<Q>2

<Z>

[Parameter]   <E>aaan~n + CR

a   "Line Pitch Width" = 0-999 (dot)

n   "Print Data" = Print Data

CR   "Control Code" = 0DH

ESC+% Rotation Specification (Start point fixing)

[Function]

Specifies the rotation of font and barcode.

[Supplement]

01. The position specification of <V> and <H> commands are absolute values from the start point.

02. The specified rotation status is maintained as long as this command is not specified again.

03. Returns to the default value (0 degree) with <Z>.

[Note]

01. When parameter "a" value is between 4 and 9, a command error occurs and the value is ignored. If the value is other than a number, it will also ignored and "0" will be printed.

02. When you print a barcode with 90° or 270° rotation, you must be careful of any barcode blurring.

Example of the Rotation Specification (Start point fixing) command

<A>

<%>1

<V>100<H>200<P>10<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <%>a

a   "Rotation"   0: 0 degree

                                    1: 90 degrees

                                    2: 180 degrees

                                    3: 270 degrees

0°   180°   90°   270°

Label feeding   Label feeding   Label feeding   Label feeding
direction   direction   direction   direction
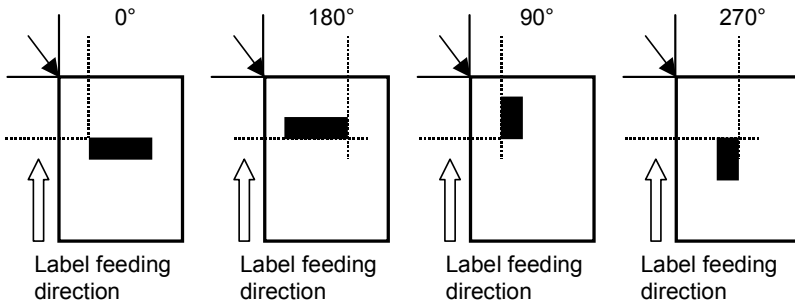
ESC+XU   XU Font Specification
(Basic Size 5 x 9 dots)

[Function]

Specifies the font structured as its basic size 5 x 9 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   Only the fixed pitch can be set for a XU font.

Example of the XU Font Specification Command

<A>

<V>100<H>200<P>2<L>0304<XU>ABCDE

<Q>2

<Z>

[Parameter]   <XU>n-n

n   "Print Data" = Data

ESC+XS   XS Font Specification (Basic Size 17 x 17 dots)

[Function]

Specifies the font structured as its basic size 17 x 17 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   For an XS font, you can select a proportional or fixed pitch.

03   A proportional and fixed pitch can be set with the User Mode of the printer LCD or command specification (The User Mode of the printer LCD is only effective for the e series).

Example of the XS Font Specification Command

<A>

<V>100<H>200<P>2<L>0304<XS>ABCDE

<Q>2

<Z>

[Parameter]   <XS>n-n

n   "Print Data" = Data

ESC+XM XM Font Specification (Basic Size 24 x 24 dots)

[Function]

Specifies the font structured as its basic size 24 x 24 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   For an XM font, you can select a proportional or fixed pitch.

03.   A proportional and fixed pitch can be set with the User Mode of the printer LCD or command specification (The User Mode of the printer LCD is only effective for the e series).

Example of the XM Font Specification Command

<A>

<V>100<H>200<P>2<L>0304<XM>ABCDE

<Q>2

<Z>

[Parameter]   <XM>n-n

n   "Print Data" = Data

ESC+XB   XB Font Specification
(Basic Size 48 x 48 dots)

[Function]

Specifies the font structured as its basic size 48 x 48 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" sec-
      tion.

02.   For an XB font, you can select a proportional or fixed pitch.

03.   A proportional and fixed pitch can be set with the User
      Mode of the printer LCD or command specification (The
      User Mode of the printer LCD is only effective for the e
      series).

Example of the XB Font Specification Command

<A>

<V>100<H>200<P>2<L>0304<XB>0ABCDE

<Q>2

<Z>

[Parameter]   <XB>an-n

a   "Smoothing Specification" =0: Smoothing invalid

                                  1: Smoothing valid (3x -12x)

n   "Print Data" = Data

ESC+XL   XL Font Specification (Basic Size 48 x 48 dots)

[Function]

Specifies the font structured as its basic size 48 x 48 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   For an XL font, you can select a proportional or fixed pitch.

03.   A proportional and fixed pitch can be set with the User Mode of the printer LCD or command specification (The User Mode of the printer LCD is only effective for the e series).

Example of the XL Font Specification Command

\<A>

\<V>100\<H>200\<P>2\<L>0304\<XL>0ABCDE

\<Q>2

\<Z>

[Parameter]   \<XL>an-n

a   "Smoothing Specification" = 0: Smoothing invalid

1: Smoothing valid (3x-12x)

n   "Print Data" = Data

ESC+U   U Font Specification
(Basic Size 5 x 9 dots)

[Function]

Specifies the font configuration to Basic Size 5 x 9 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   The U Font is set only for the Fixed Pitch.

Example of the U Font Specification Command.

<A>

<V>100<H>200<P>2<L>0304<U>ABCDE

<Q>2

<Z>

[Parameter]   <U>n-n

N   "Print Data" = Data

ESC+S   S Font Specification
(Basic Size 8 x 15 dots)

[Function]

Specifies the font configuration to Basic Size 8 x 15 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   The S Font is set only for the Fixed Pitch.

Example of the S Font Specification Command.

<A>

<V>100<H>200<P>2<L>0304<S>ABCDE

<Q>2

<Z>

ESC+M   M Font Specification
(Basic Size 13 x 20 dots)

[Function]

Specifies the font configuration to Basic Size 13 x 20 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   The M Font is set only for the Fixed Pitch.

Example of the M Font Specification Command.

<A>

<V>100<H>200<P>2<L>0304<M>ABCDE

<Q>2

<Z>

[Parameter]   <M>n-n

n   "Print Data" = Data

ESC+WB   WB Font Specification (Basic Size 18 x 30 dots)

[Function]

Specifies the font configuration to Basic Size 18 x 30 dots.

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

02.   The WB Font is set only for the Fixed Pitch.

Example of the WB Font Specification Command.

<A>

<V>100<H>200<P>2<L>0304<WB>0ABCDE

<Q>2

<Z>

[Parameter]   <WB>an-n

a   "Smoothing Specification" =0 : Smoothing inactive

                                                              1 : Smoothing active (3x - 12x)

n   "Print Data" =Data

ESC+WL   WL Font Specification (Basic Size 28 x 52 dots)

[Function]

Specifies the font configuration to Basic Size 28 x 52 dots.

[Supplement]

01. For the font image, refer to the "Font Character Set" section.

02. The WL Font is set only for the Fixed Pitch.

Example of the WL Font Specification Command.

<A>

<V>100<H>200<P>2<L>0304<WL>0ABCDE

<Q>2

<Z>

[Parameter]   <WL>an-n

a   "Smoothing Specification" =0 : Smoothing inactive

1 : Smoothing active (3x - 12x)

n   "Print Data" = Data

ESC+OA   OCR-A Font

[Function]

Specifies the OCR-A font (alphanumeric and symbol).

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

Example of the OCR-A Font Specification Command

<A>

<V>100<H>100<P>2<L>0202<OA>ABC

<Q>2

<Z>

[Parameter]   <OA>n-n

n   "Print Data" = Data

Printer Type	Font Size (dot)
CL408e	15 x 22
CL412e	22 x 33
M-8400RVe	15 x 22
CL608e	15 x 22
CL612e	22 x 33
CT400DT/TT	15 x 22
CT410DT/TT	22 x 33
M8485Se	15 x 22
M8490Se	22 x 33
M8460Se	15 x 22
M8459Se	15 x 22

ESC+OB   OCR-B Font

[Function]

Specifies the OCR-B font (alphanumeric and symbol).

[Supplement]

01.   For the font image, refer to the "Font Character Set" section.

Example of the OCR-B Font Specification Command

\<A\>

\<V\>100\<H\>100\<P\>2\<L\>0202\<OB\>ABC

\<Q\>2

\<Z\>

[Parameter]   \<OB\>n-n

n   "Print Data" = Data

Printer Type	Font Size (dot)
CL408e	20 x 24
CL412e	30 x 36
M-8400RVe	20 x 24
CL608e	20 x 24
CL612e	30 x 36
CT400DT/TT	20 x 24
CT410DT/TT	30 x 36
M8485Se	20 x 24
M8490Se	30 x 36
M8460Se	20 x 24
M8459Se	20 x 24

ESC+$ Outline Font Shape Specification

[Function]

Specifies the font type, size and style for the outline font.

[Supplement]

01. An italics is a 15-degree slanted style with the Font Width Specification.
02. The print information specification of the outline font is specified with <$=> after this command.
03. Be aware that if the specified dot is small for the font style 1-9, it will not be recognized as a font.
04. If the size specification is out of range, a default value of 50 dots is applied. However, some fonts less than 24 dots are not printed clearly.

Example of the Outline Font Shape Specification Command

<A>
<V>100<H>100<P>2<L>0101
<$>A, 100, 100, 1<$=>SATO
<Q>2
<Z>

[Parameter]   <$>a, bbb, ccc, d

a "Font Type Specification" = A: Helvetica Bold
                                   (proportional)
                                 B: Helvetica Bold
                                 (fixed character pitch)

b "Font Width Specification" = 50-999

c "Font Height Specification" = 50-999

d "Font Style Specification" = 0: Standard font (black)
                                 1: Inversion font (enclose font)
                               2: Gray font (pattern 1)
                               3: Gray font (pattern 2)
                               4: Gray font (pattern 3)
                               5: Shadow font
                               6: Inversion with shadow font
                               7: Mirror font
                               8: Standard italic font
                               9: Inversion with shadow italic font

ESC+$=   Outline Font Print Specification

[Function]

Specifies the print of an outline font set with <$>.

[Supplement]

01.   Specify each outline font style with <$> before using this command.

02.   The specification for the font height includes the area of ascender and descender. In addition, each letter size font width varies when this font is applied to the proportional font.

03.   The font pitch can be specified with <P>.

04.   An italics is a 15-degree slanted style with the Font Width Specification. The specification for the font height includes the area of ascender and descender.

05.   Be aware that if the specified dot is small for the font style 1-9, it will not be recognized as a font.

06.   If the size specification is out of range, a default value of 50 dots is applied. However, some fonts less than 24 dots are not printed clearly.

Example of the Outline Font Print Specification Command

<A>

<V>100<H>100<P>2<L>0202

<$>A, 100, 100, 1<$=>SATO

<Q>2

<Z>

[Parameter]   <$=>n-n

n   "Print Data" = Data

ESC+RD   CG Font Specification

[Function]

Specifies the type of CG font, font style, font size and print data.

[Supplement]

01. The font size is set with "Dot Specification" or "Point Specification".

02. The dot size varies according to the printer model.
     For CL408e, M-8400RVe, CL608e, CT400DT/TT,
     One dot = 0.125mm
     For CL412e, CL612e, CT410DT/TT, MT/MR110w,
     One dot = 0.083mm

03. When one point is converted to mm,
     One point = 0.35mm

Example of the CG Font Specification Command

<A>

<V>100<H>100<P>2<L>0202

<RD>A00, P10, P10, SATO

<Q>2

<Z>

[Parameter]   <RD>abb, ccc, ddd, n-n

a	"CG Font Type"	=	A: "CG Times"
		=	B: "CG Triumvirate"
b	"Font Style"	=	00 "Normal"
c	"Horizontal Size"	=	004-999 (Dot specification)
			P02-P99 (Point specification)
d	"Vertical Size"	=	004-999 (Dot specification)
			P02-P99 (Point specification)
n	"Print Data"	=	Data

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Model	Maximum Horizontal Size	Maximum Vertical Size
CL408e M8400RVe	832 dots	832 dots
CL412e CL608e CL612e M8485Se M8490Se M8460Se	999 dots	999 dots
M8459Se	896 dots	896dots

Note:

Above maximum sizes are applied to both printing and specifying.

ESC+B   Barcode Specification (Ratio 1:3)

[Function]

Specifies a 1:3 ratio barcode with a narrow bar and wide bar.

[Supplement]

01. Do not specify anything other than the above mentioned code to parameter "a".

02. There is no module structure ratio available for the following barcode types.
(EAN-13, EAN-8, CODE93, UPC-E, CODE128, UPC-A, UCC-128, POSTNET)

03. You can specify a character space with the Character Pitch Specification <P> for the following barcode types.
(Codabar, CODE39, Industrial 2 of 5, Matrix 2 of 5)

04. The character pitch specification <P> becomes effective by immediately specifying it before this command. If it is not located immediately before this command, the default value (one dot) is applied.

05. The character pitch is a multiplied value of the character pitch specification value or default value (if a character pitch is not specified) and the thin width specification.
Example: Character pitch specification (none or 0, 1) x Thin bar width (2L)
= Font space (2 dots)
Character pitch specification (2) x Thin bar width (3L) = Font space (6 dots)

06. A barcode is not printed if the applicable barcode type is not set in the data part.

07. [C/D] of CODE128 and CODE93 is automatically generated.

08. C/D of EAN-13, UPC-A and EAN-8 can be automatically generated.
Example: Data 11-digit Input = C/D is calculated by adding "0" to the top.
Data 12-digit Input (7-digit input) = C/D calculation
Data 13-digit Input (8-digit input) = No C/D calculation.
However, () is for JAN/EAN-8.

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Example of the 1:3 Ratio Barcode Specification Command

```
<A>
<V>100<H>100<B>103160*1234567890*
<Q>2
<Z>
```

[Parameter]   <B>abbcccn-n

a "Barcode Type" =	0: Codabar
	1: CODE39
	2: Interleaved 2 of 5
	3: UPC-A/EAN-13 (without a guide bar or human readable font)
	4: EAN-8 (without a guide bar or human readable font)
	5: Industrial 2 of 5
	6: Matrix 2 of 5
	A: MSI
	C: CODE93
	E: UPC-E
	G: CODE128
	F: Bookland
	H: UPC-A (without a guide bar or human readable font)
	I: UCC/EAN-128 (18 digit fixed barcode for standard carton ID)
	P: POSTNET
b "Narrow Bar/Space Width" =	01-12
c "Bar Top Heigth" =	001-600 (dots)
n "Print Data" =	Data

ESC+BC   CODE93 Barcode Specification

[Function]

Specifies the CODE93 barcode.

[Supplement]

01.   The C/D is automatically generated.

02.   The maximum number of digits is 99.

03.   The data digits and input data number should always be equal.

04.   If the data digit and input data number are not equal, a command error occurs and the character will not be printed correctly.

Example of the CODE93 Barcode Specification Command

<A>

<V>100<H>200<BC>031600512345

<Q>2

<Z>

[Parameter]   <BC>aabbbccn-n

a   "Narrow Bar/Space Width" = 01-12dots

b   "Barcode Top" =   001-600dots

c   "Data digits" =   01-99

n   "Print Data" =   Data

ESC+BG   CODE128 Barcode Specification

[Function]

Specifies the CODE 128 Barcode.

[Supplement]

01.   The C/D is generated automatically.

Example of the CODE128 Barcode Specification Command.

<A>

<V>100<H>200<BG>031600123456789

<Q>2

<Z>

[Parameter]   <BG>aabbbn-n

a   "Narrow Bar/Space Width" = 01-12dots

b   "Barcode Height" =   001-600dots

n   "Print Data" =   Data

01.   When using the CODE128 Start Character C, make sure to specify the print data as even numbers.

02.   When the Start Character C has been specified as an uneven number, the first letter of the print data should be switched to either Start Character A or B, then the remaining data should be set to Start Character C and converted into an even number.

Example 1: In the case of 15 digits "123456789012345"

<B>1<C>23456789012345

Example 2: In the case of 9 numbers and 6 letters and numbers "123456789ABC123"

<C>12345678<B>9ABC123

03.   When the Start Character C has been specified as an uneven number, a command error message will appear and the barcode will not be printed.

04.   Please be aware that if the printer's Dip Switch 2-8 is set to ON, and if the Start Character C has been specified as an uneven number, the last number printed on the data will be a "0" to make it an even number.

ESC+BI   UCC/EAN-128 Specification

[Function]

Specifies the UCC/EAN-128 barcode.

[Supplement]

01.   The start code, function code, end code and identifier (only "00" is supported) are automatically added.

02.   The modulus 10 check character and modulus 103 check character are automatically generated.

03.   For the code table, refer to the "UCC/EAN-128" coming with this manual.

04.   The consecutive number barcode data can be used.

05.   Printing is executed for the automatic description font specification according to the following regulation.

06.   The character pitch is fixed to 10 dots for the barcode and description font width.

07.   When the width of a barcode is wider than the description font, printing is started from the barcode print start position.

08.   When the width of a barcode is narrower than the description font, printing is started by adjusting the description font with the center of the barcode.

09.   The font type of the description font is OCR-B.

10.   When the description font is out of the print range, it is not printed. When you specify the description font "Valid", specify <V> and <H> by considering the description font printing.

Example of the UCC/EAN-128 Specification Command

<A>

<V>100<H>200<BI>03160212345678901234567

<Q>2

<Z>

(00) 1 2345678 901234567 5

[Parameter]   <BI>aabbbcn-n

a   "Narrow Bar/Space Width" =01-12dots
b   "Barcode Top" =   001-600dots
c   "Barcode Description Font Specification" =

                    0: Without Description Font
                    1: With Description Font (top of a barcode)
                    2: With Description Font (bottom of a barcode)

n   "Print Data" =   Data
                    EAN-128 (Barcode for the Standard Carton ID)
                    Fixed 18 digits.

- Transport Container Code Identifier.
- Packing Type
- Country Code, Maker Code
- Shipping Container Consecutive Number
- Check Digit.

*As the Check Digit is automatically added on, set the data as Check Digit with 17 digits omitted.

ESC+BP   Postnet Specification

[Function]

Specifies the Postnet Code.

[Supplement]

01.   The Postnet codes are mentioned below. This command
      will not be valid if the values are not within the digit speci-
      fications.

- 5 digit specification (Postnet-32 format)

- 6 digit specification (Postnet-37 format)

- 9 digit specification (Postnet-52 format)
  1 digit specification (Postnet-62 Delivery Point format)

Example of the Postnet Specification Command

<A>

<V>100<H>200<BP>01234567890

<Q>2

<Z>

Parameter   <BP>n-n

N   "Print Data" = Data (Address Display Number)

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ESC+BF   Bookland Specification

[Function]

Specifies the Bookland Barcode.

[Supplement]

01.   Please set ONLY the values 0-9 in the parameters.

Example of the Bookland Barcode Specification Command.

<A>

<H>325<V>725<B>D30315009827721123

<L>0101<H>295<V>800<OB>0

<H>340<V>878<OB>98277

<H>480<V>878<OB>21123

<H>640<V>760<BF>0313021826

<H>655<V>730<OB>21826

<Q>1

<Z>

[Parameter]   <BF>bbccn-n

b   "Narrow Bar Width" = 01-03dots

c   "Bar Height" =   001-600dots

n   "Print Data" =   2-5 digits

ESC+D   Barcode Specification (Ratio 1:2)

[Function]

Specifies a 1:2 ratio barcode with a narrow bar and a wide bar.

[Supplement]

01. Do not specify anything other than the above mentioned code to parameter "a".

02. There is no module structure ratio available for the following barcode types: EAN-13, EAN-8, UPC-A

03. For the following barcode types, the character pitch specification <P> becomes effective by immediately specifying it before this command. If it is not located immediately before this command, the default value (one dot) is applied.
    (Codabar, CODE39, Industrial 2 of 5, Matrix 2 of 5)

04. The character pitch specification <P> is effective by specifying immediately before this command. If it is not located immediately before this command, the default value (one dot) is applied.

05. The character pitch is a multiplied value of the character pitch specification value or default value (if a character pitch is not specified) and the narrow width specification.
    Example: Character pitch specification (none or 0, 1) x narrow bar width (2L)
    = Font space (2 dots)
    Character pitch specification (2) x narrow bar width (3L) = Font space (6 dots)

06. A barcode is not printed if the applicable barcode type is not set in the data part.

07. C/D of EAN-13, UPC-A and EAN-8 can be automatically generated.
    Example: Data 11-digit Input = C/D is calculated by adding "0" to the top.
    Data 12-digit Input (7-digit input) = C/D calculation
    Data 13-digit Input (8-digit input) = No C/D calculation.

Example of the 1:2 Ratio Barcode Specification Command

<A>

<V>100<H>200<D>103160*1234567890*

<Q>2

<Z>

[Parameter]   <D>abbcccn-n

a   "Barcode Type" = 0: Codabar

1: CODE39

2: Interleaved 2 of 5

3: EAN-13
(with a guide bar, without a description font)

4: EAN-8
(with a guide bar, without a description font)

5: Industrial 2 of 5

6: Matrix 2 of 5

H: UPC-A
(with a guide bar, without a description font)

b   "Narrow Bar Width" = 01-12dots

c   "Barcode height" =001-600dots

n   "Print Data" =   Data

ESC+D&ESC+d   Barcode Specification
(Selection of a description character)

[Function]

Specifies the guide and center bar long type barcode.

[Supplement]

01.   A description character is added to a specified character.

02.   C/D of JAN/EAN-13, UPC-A and JAN/EAN-8 can be auto-
matically generated.
Example: Data 11-digit Input = C/D is calculated by adding
"0" to the top.
Data 12-digit Input (7-digit input) = C/D calculation
Data 13-digit Input (8-digit input) = No C/D calculation.

03.   If you specify anything other than the specified data, the
character will not printed. In addition, if the ratio of the bar-
code is small and you specify a large character type, a
description character may overlap the barcode.

Example of the Barcode Description Character Selection Spec-
ification Command

<A>

<V>100<H>200<D>302060490308011505

<XS>490308011505

<Q>2

<Z>

[Parameter]   <D>abbcccn-n +ESC+dn-n

a	"Barcode Type" =	3: EAN-13
		4: EAN-8
		H: UPC-A
b	"Narrow Bar Width" =	01-12dots
c	"Barcode Height" =	001-600dots
d	"Character Type Specification" =	XU
		XS
		XM
		XB
		XL
		OA
		OB

ESC+BD Barcode Specification (Ratio 2:5)

[Function]

Specifies a 2:5 ratio barcode with a narrow bar and wide bar.

[Supplement]

01. Do not specify anything other than the above mentioned code to parameter "a".

02. There is no module structure ratio available for the following barcode types: EAN-13, EAN-8, CODE93, UPC-E, CODE128, UPC-A, UCC-128, POSTNET

03. You can specify a character space with the Character Pitch Specification <P> for the following barcode types. (Codabar, CODE39, Industrial 2 of 5, Matrix 2 of 5)

04. The character pitch specification <P> becomes effective by immediately specifying it before this command. If it is not located immediately before this command, the default value (2 dot) is applied.

05. The character pitch is a multiplied value of the character pitch specification value or default value (if a character pitch is not specified) and the narrow barspecification.
Example: Character pitch specification (none or 0, 2) x Thin bar width (2L) =
Font space (4 dots)
Character pitch specification (1) x narrow bar width (3L) = Font space (3 dots)
Character pitch specification (3) x narrow bar width (3L) = Font space (9 dots)

06. A barcode is not printed if the applicable barcode type is not set in the data part.

07. C/D of EAN-13, UPC-A and EAN-8 can be automatically generated.
Example: Data 11-digit Input = C/D is calculated by adding "0" to the top.
Data 12-digit Input (7-digit input) = C/D calculation
Data 13-digit Input (8-digit input) = No C/D calculation.

Example of the Ratio 2:5 Barcode Specification Command

\<A>

\<V>100\<H>200\<BD>103160*1234567890*

\<Q>2

\<Z>

[Parameter]   \<BD>abbcccn-n

a   "Barcode Type" = 0: Codabar

                              1: CODE39

                              2: Interleaved 2 of 5

                              3: EAN-13

                              (with a guide bar and description font)

                              4: EAN-8

                              (with a guide bar and description font)

                              5: Industrial 2 of 5

                              6: Matrix 2 of 5

                              H: UPC-A

                              (with a guide bar and description font)

b   "Narrow Bar Width" =01-12dots

c   "Barcode Height" =001-600dots

n   "Print Data "=   Data

ESC+BT   Barcode Ratio Registration Specification

[Function]

Specifies a ratio with a narrow bar and wide bar as a free value.

[Supplement]

01.   The barcode print specification with the ratio definition should be done by specifying <BW> after this command.

02.   When <BW> and <Q> are missing, only specify the narrow and wide bar ratio registration by specifying this command.

03.   Only one registration type is effective.

04.   If you set anything other than the specified data, a command error occurs and the registration fails.

05.   If the previous registration is regular data and the data you are trying to register is an invalid data, the previous data is printed.

Example of the Barcode Ratio Registration Specification Command

<A>

<BT>103060306

<V>100<H>200<BW>01233*ABCD*

<Q>2

<Z>

[Parameter]   <BT>abbccddee

a	"Barcode Type" =	0: Codabar
		1: CODE39
		2: Interleaved 2 of 5
		5: Industrial 2 of 5
		6: Matrix 2 of 5
b	"Narrow Space" =	01-99dots
c	"Wide Space" =	01-99dots
d	"Narrow Bar" =	01-99dots
e	"Wide Bar" =	01-99dots

ESC+BW   Barcode Ratio Registration Print Specification

[Function]

Specifies the barcode registered with the Barcode Ratio Registration Specification command <BT>.

[Supplement]

01.   You can specify a character space with the Character Pitch Specification <P> for the following barcode types: Codabar, CODE39, Industrial 2 of 5, Matrix 2 of 5

02.   The character pitch specification <P> is effective by specifying immediately before this command. If it is not located immediately before this command, the default value (narrow space value specified with the <BT> is applied.

03.   The character pitch is a multiplied value of the character pitch specification value or default value (if a character pitch is not specified) and the thin width specification.
Example:
When a narrow space value specified with <BT> = 3,
Character pitch specification (none or 0, 3) x Thin bar width (2) = Font space (6 dots)
When a character pitch is specified,
Character pitch specification (2) x Thin bar width (3) = Font space (6 dot)

04.   If you specify anything other than the specified data, a barcode is not printed.

05.   If <BT> is not specified, a barcode is printed with the ratio of the narrow bar and wide bar that the <BT> was registered.
However, if <BT> was not registered, barcode is not printed.

Example of the Barcode Raito Registration Print Specification
<A>
<BT>102060206
<V>100<H>200<BW>02160*12345*
<Q>2
<Z>

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[Parameter]   <BW>aabbn-n

a "Expansion factor"=01-12

b "Barcode Height"=001-600

n "Print Data"=   Data

ESC+FW   Lines and Boxes Print Specification

[Function]

Specifies the line and box print.

[Supplement]

01.   When the rotation command <%> is used, the coordinate of the vertical and horizontal against the start point is reversed if a 90 degree or 270 degree rotation is applied.

Example of the Line and Box Print Specification Command

<A>

<V>100<H>200<FW>0808V300H400

<Q>2

<Z>

When a line is printed,

[Parameter]<FW>aabcccc

a	"Line Width" =	02-99 (dots)
b	"Specification of Horizontal and Vertical direction" =	
		H: Horizontal direction
		V: Vertical direction
c	"Line Length" =	1-H Max
		1-V Max

When a box is printed,

[Parameter]<FW>aabbVccccHdddd

a	"Vertical Line Width" =	02-99 (dots)
b	"Horizontal Line Width" =	02-99 (dots)
c	"Vertical Line Length" =	1-V Max
d	"Horizontal Line Length" =	1-H Max

Model	Horizontal Line Length (dot)	Vertical Line Length (dot)
CL408e	832	1424
CL412e	1248	2136
M-8400RVe	832	1424
CL608e	1216	1424
CL612e	1984	2136
CT400DT/TT	832	3200
CT410DT/TT	1248	4800
M8485Se	1024	1424
M8490Se	1344	2136
M8460Se	1216	1424
M8459Se	896	1424

ESC+(Reverse Print Specification

[Function]

Specifies the reverse print.

[Supplement]

01.   For the print start position, specify the <H> and <V> commands before this command.

02.   When the rotation command <%> is used, the coordinate of the vertical and horizontal against the start point is reversed if a 90 degree or 270 degree rotation is applied. If the print start position overruns, a command error occurs and the character is not printed.

03.   When the print start position overruns, a command error occurs and the black/white inversion is not printed.

04.   If the Print Start Position goes over, a command error will be displayed and the Black and White Inversion will not be printed.

Specify the print area so that the black printed area does not exceed more than 30% of the entire area.

Example of the Black/White Inversion Print Specification Command

<A>

<V>50<H>50<P>2<L>0202<XM>ABCD

<V>50<H>50<(>200, 70

<Q>2

<Z>

[Parameter]   <(>aaaa, bbbb

a "Inversion Area Specification in Horizontal direction" = 8-H Max

b "Inversion Area Specification in Vertical direction" = 8-V Max

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<V>50<H>50<(>200, 70

H50

V50

70

200

A B C
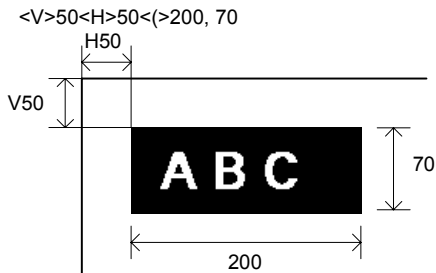
Model	Inversion in Horizontal Area (dot)	Inversion in Vertical Area (dot)
CL408e	832	1424
CL412e	1248	2136
M-8400RVe	832	1424
CL608e	1216	1888
CL612e	1984	2136
CT400DT/TT	832	1424
CT410DT/TT	1248	2136
M8485Se	1024	1424
M8490Se	1344	2136
M8460Se	1216	1424
M8459Se	896	1424

ESC+J   Journal Print Specification

[Function]

Specifies the Journal print.

[Supplement]

01.   Prints the journal from <V>2<H>2 position.

02.   The character pitch is 2 dots and the line pitch is 16 dots.

03.   The font type is an X21 font and printed at 2 x 2.

04.   This command cannot be used with other commands of
        the Journal Print command. However, <C> and <(> are
        excluded.

Example of the Journal Print Specification Command

<A>

<J>

ABCD+CR

EFGH+CR

<Z>

 [Parameter] <J>a-a+CR

a   "Journal Print Column" = Print Data

CR   "Control Code (0DH)"

ESC+G   Graphic Print Specification

[Function]

Specifies a graphic print.

[Supplement]

01.   The length of the code of specification "B" is longer than specification "H". However, the transfer data length is split in half so you have an advantage in terms of capacity.

02.   The rotation <%> and enlargement <L> commands can be used.

Example of the Graphic Print Specification Command

<A>

<V>50<H>50<G>H02000288888888…8888

<Q>2

<Z>

[Parameter]   <G>abbbcccn-n

a   "Specifies the data as hex and binary"

	H:	Hex data
		Separate an 8-bit data into 4-bit data and output as a hex code that supports ASCII.
	B:	Binary data
		An 8-bit data is output as one font data.

b   "Specifies a graphic area of the H direction as the byte unit"

c   "Specifies a graphic area of the V direction as the byte unit"

n   "Graphic Data"

Model	Maximum Byte in H direction	Maximum Byte in V direction
CL408e	104	178
CL412e	156	267
M-8400RVe	104	178
CL608e	152	178
CL612e	248	267
CT400DT/TT	104	178
CT410DT/TT	156	267
M8485Se	128	178

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M8490Se	168	267
M8460Se	152	178
M8459Se	112	178

ESC+GP   PCX File Print Specification

[Function]

Specifies the PCX file print created with a Windows drawing applications.

[Supplement]

01.   Data can be sent as binary data.

02.   In a PCX file, the first 128 byte of the data is treated as a header and the following data is compressed.

03.   If the total data does not match with the transferred data, printing will not be successful.

04.   The total byte is the size that appears by entering the „dir" command.

05.   A PCX file can only be used in Black/White mode. A PCX file with the color mode is not printed because a command error occurs.

06.   You need Windows to create a PCX file. A PCX file cannot be created if Windows is not installed in your PC.

07.   Both the rotation <%> and enlargement <L> commands can be used.

[Parameter]   <GP>aaaaa, n-n

a   "Total Byte of a PCX file"

n   "Data"

ESC+GM   BMP File Print Specification

[Function]

Specifies the BMP File Print created with a Windows drawing applications.

This command cannot be used with the CT series.

[Supplement]

01.   Data can be sent as binary data.

02.   In a BMP file, the first 62 bytes of data are treated as a header and the following data is compressed.

03.   If the total data does not match with the transferred data, printing will not be successful.

04.   The total byte is the size that appears by selecting the Property command.

05.   A BMP file can only be used in the Black/White mode. A BMP file with the color mode is not printed because a command error occurs.

06.   You need Windows to create a BMP file.

07.   Both the rotation <%> and enlargement <L> commands can be used.

[Parameter]   <GM>aaaaa, n-n

a   "Total Byte of a BMP file"

n   "Data"

ESC+0   Part Editing Function Specification

[Function]

Specifies the Part Editing Function for the previous printing data.

[Supplement]

01.   This function is used when a part of the previous data is changed.

02.   Find the previous print data with the Part Editing command <0> and edit the part then print the data. You need to specify the same print position to be changed for the previous data and send the changed data.

03.   The previous data specified for the same position is cleared.

04.   This command is valid until you set the <Z> after <A>.

Previous Print

<A> [DATA1] n1 [DATA2] n2…..<Z>

Partly Changed Print

<A> <0> [DATA2] n3…..<Z>

First page   Second page

```
 ┌─────────┐         ┌─────────┐
 │ ABC     │         │ ABC     │
 │ DEF     │  ====>  │ 1 2 3   │  <── Part Editing
 │         │         │         │
 └─────────┘         └─────────┘
```

05.   When the Rotation command applies to the partly edited position, you need to use the command during editing.

06.   This command should be used with the same fixed pitch, font and digit.

Example of the Part Editing Function Specification Command

```
<A>
<V>100<H>200<P>2<L>0202<XM>ABC
<V>200<H>200<P>2<L>0202<XM>DEF
<Q>1
<Z>

<A>
<0>
<V>200<H>200<P>2<L>0202<XM>123
<Q>1
<Z>
```

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ESC+WD   Copy within a label (Part Copy) Specification

[Function]

Specifies the Copy within a label (Part Copy).

[Supplement]

01.   For the print start position, specify <V> and <H> before this command.

02.   Do not specify the copy destination in the copy source range.

03.   When a rotation command <%> is used, the coordinate of the vertical and horizontal against the start point is reversed if 90 degree or 270 degree rotation is applied. If the print start position overruns, a command error occurs and the character is not printed.

Example of the Copy within a label (Part Copy) Specification Command

<A>

<V>50<H>50<P>2<L>0202<XS>123

<V>300<H>100<WD>V50H50Y200X400

<Q>2

<Z>

[Parameter]   <WD>VaaaaHbbbbYccccXdddd

a	"V Start point of copy source" =	1-V Max
b	"H Start point of copy source" =	1-H Max
c	"Vertical copy size of copy source" =	1-V Max
d	"Horizontal copy size of copy source" =	1-H Max
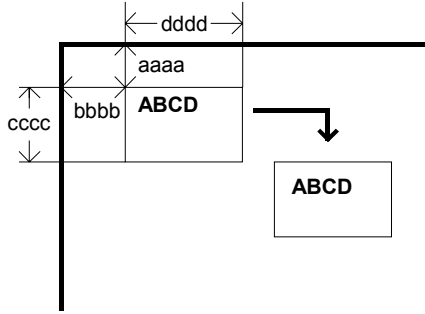
Model	Copy source V start point of Vertical copy size	Copy source H start point of Horizontal copy size
CL408e	2848 dots	832 dots
CL412e	4272 dots	1248 dots
M-8400RVe	2848 dots	832 dots
CL608e	3776 dots	1216 dots
CL612e	4272 dots	1984 dots
CT400DT/TT	3200 dots	832 dots
CT410DT/TT	4800 dots	1248 dots
M8485Se	2848 dots	1024 dots
M8490Se	4272 dots	1344 dots
M8460Se	2848 dots	1216 dots
M8459Se	2848 dots	896 dots

ESC+F   Sequential Number Print Specification

[Function]

Set this command before the Data Setting command of a font or barcode and print the sequential number of the connected data.

[Supplement]

01.   The sequential number specification position for one format can be set up to 8.

02.   You cannot copy the numbers that are arranged continuously. However, you can copy the part when the number is printed continuously.

03.   Black/White inversion cannot be applied to the sequential numbers.

04.   The automatic line feed <E> cannot be used.

Example of the Sequential Number Print Specification Command

<A>

<V>100<H>100<P>2<L>0202

<F>001+001, 5, 0<XS>10000

<Q>2

<Z>

[Parameter]   <F>aaaabcccc, dd, ee, f

a "Number of times to repeat the same data"
       = 1-9999

b "Increase/Decrease Specification"
        = +: Addition
        = -: Reduction

c "Setting Increase/Decrease value"
       = 1-9999

d "Sequential Number Effective Digit"
       = 1-99 Default 8 (can be omitted)

e "Low Level Invalid Digit"
       = 0-99 Default 0 (can be omitted)

f "Decimal or Hex Sequential Number Specification"
        = 0: Decimal (Default can be omitted)
        = 1: Hex

ESC+PS   Proportional Pitch Specification

[Function]

Specifies the proportional pitch.

[Supplement]

01.   The effective font types are from XU to XL.

02.   The proportional print is effective after specifying this command.

03.   This command is effective between <A> and <Z>.

04.   The proportional print is not effective if you set anything other than the specified data.

Example of the Proportional Pitch Specification Command

<A>

<PS>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

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ESC+PR   Proportional Pitch Cancel Specification

[Function]

Cancels the proportional pitch specification.

[Supplement]

01.   When the printer is shipped, this command (Proportional Pitch Cancel) is set as a default (Fixed Pitch). You can set the default settings (Fixed/Proportional) by using the "User Mode Setting" of the printer LCD and/or "Printer Setting Tool".

Example of the Proportional Pitch Cancel Specification Command

\<A>

\<PS>

\<V>100\<H>200\<P>2\<L>0202\<XM>ABCD

\<PR>

\<V>300\<H>200\<P>2\<L>0202\<XM>ABCD

\<Q>2

\<Z>

ESC+& Form Overlay Registration Specification

[Function]

Specifies the form overlay registration.

[Supplement]

01. The fixed print information is stored with this command and output with drawing data by entering the Recall Specification </>.

02. This command should be specified at the end of a data string to be stored. The effective area of the drawing registration is identical to the printing area of the printer.

03. This command can register only one form.

04. In order to change the information, you must clear the form overlay <*&> and register new data.

05. The fixed data registered with this command is deleted when you turn off the printer.

Example of the Form Overlay Registration Specification Command

<A>

<V>100<H>50<FW>1010V800H750

<V>100<H>50<FW>0505V760H710

<V>150<H>100<XB>0MODEL

<&>

<Z>

ESC+/   Form Overlay Recall Specification

[Function]

Specifies the form overlay recall.

[Supplement]

01.   This command recalls and prints the information regis-
tered with <&>.

02.   When this command is detected in the print data column,
it is combined with drawing data stored in the form overlay
and printed.

Example of the Form Overlay Call Specification Command

<A>

</>

<V>200<H>100<P>0<$>B, 100, 100, 6

<$=>SATOPRINTER

<V>720<H>150<B>102100*95000012345*

<Q>2

<Z>

ESC+ID   Job ID Number Specification

[Function]

Specifies the Job ID Number for the status return.

[Supplement]

01.   The command is effective when receiving the status request [ENQ] while printing (including QTY is not 0, offline and error) is executed with the Status Return Communication protocol.

02.   If the status request [ENQ] is received while printing is not being executed (QTY is 0, when the printer is started or when there is no received data), a space [20H] is set to the status and returned to the printer.

03.   The information between <A> and <Z> is invalid when this command is received with only the Registration command (Format, Graphics, Custom-design character, etc.).

04.   The last specification is valid when this command (<A> - <ID> - <ID> - <Z>) is specified to more than one place within one form.

05.   For more information, refer to the "Interface: High Speed RS-232C" manual.

Example of the Job ID Number Specification for the status return Command

<A>

<ID>01

<V>200<H>100<P>0<$>B, 100, 100, 6

<$=>SATOPRINTER

<Q>2

<Z>

[Parameter]   <ID>aa

a   "ID Number"= 00-99

ESC+WK   Job Name Specification

[Function]

Specifies the Job Name for status return.

[Supplement]

01.   The command is effective when receiving the status request [ENQ] while printing (including QTY is not 0, offline and error) is executed with the Status Return Communication protocol.

02.   The information between <A> and <Z> is invalid when this command is received with only the Registration command (Format, Graphic, Custom-design character, etc.).

03.   The last specification is valid when this command (<A> - <WK> -<WK> - <Z>) is set in more than one place within one form.

04.   For more information, refer to the "Interface: High Speed RS-232C" manual.

Example of the Job Name Specification for status return Command

<A>

<WK>TEST01

<V>200<H>100<P>0<$>B, 100, 100, 6

<$=>SATOPRINTER

<Q>2

<Z>

[Parameter]   <WK>a-a

a   "Job Name"= ASCII CODE 16 digit

ESC+NUL (~) Multi Cut Specification

[Function]

Specifies this command when you cut a label with any number.

[Supplement]

01.   This command is effective for a printer with a cutter.

02.   NUL is set as (00hex) and "~" as (7Ehex).

03.   When you enter "0" cutting is ommited.

04.   The print and cut multiple should not exceed the maximum print number (999999).

05.   This command should be set after specifying the <Q> command. The <Q> command specifies the number of labels to be cut.

```
<A>
  ┊
<Q>4
<NUL>2
<Z>
```
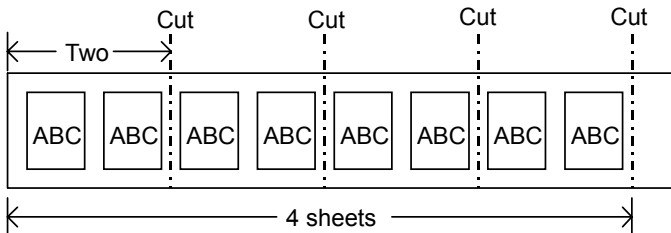

Example of the Multi Cut Specification Command

```
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>4
<NUL>2
<Z>
```

[Parameter]   <NUL>aaaa

a   "Print number before cutting"= 1-9999

ESC+~A   Cut Number Unit Specification

[Function]

Specifies the cut number unit.

[Supplement]

01.   This command is effective for a printer with a cutter.

02.   If you do not specify this command with the Cutter Operation Mode, one label cut applies.

03.   If a = 0 is specified, the cut is not applied.

04.   The <~A> command should be set before specifying the <Q> command.
       The <Q> command specifies the number of label to be printed.

```
<A>
 |
<~A>2
<Q>7
<Z>                                           Remaining 1
```
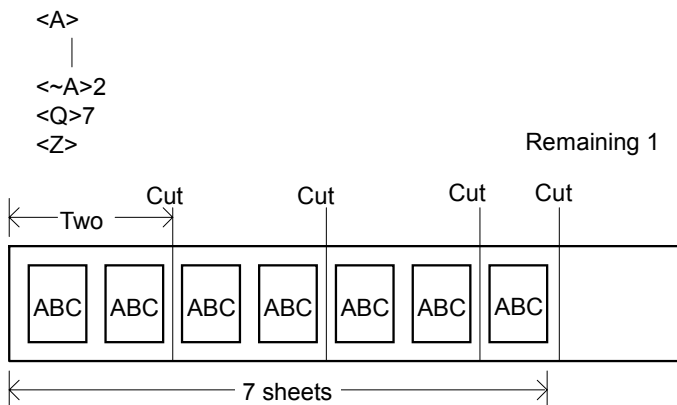

Example of the Cut Number Unit Specification Command

<A>

<V>100<H>200<P>2<L>0202<XM>ABCD

<~A>2

<Q>7

<Z>

[Parameter]   <~A>aaaa

a   "Cut Unit Number"= 0-9999

ESC+~B   Cut Operation Specification

[Function]

Specifies the cut operation.

[Supplement]

01. This command is effective for a printer with a cutter.

02. This command is used while the printer has stopped the cut status of NUL (Multi Cut Specification) or ~A (Cut Number Unit Specification).

03. This command should be used by differentiating between <A> and <Z>.

04. This command cannot be used with other commands.

05. Print Stop Position

A: Printed
B: No Print
C: No Print
D: No Print

06. Command Reception
    1. Feed a label in the cut position.
    2. Cut a label.
    3. Back feed to the head position.
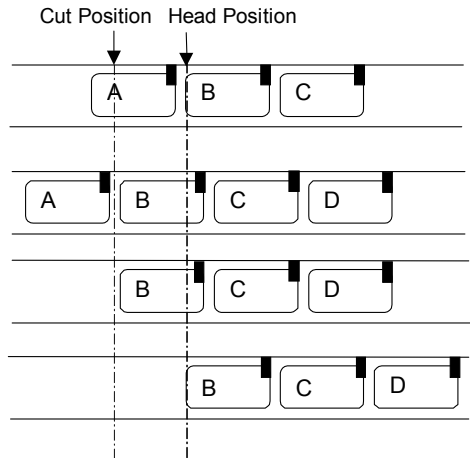
Example of the Cut Operation Specification Command

<A>

<~B>

<Z>

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ESC+A1 Label Size Specification

[Function]

Specifies the label size.

[Supplement]

01. If you use a label smaller than the width of the printer head, you can adjust the start position to the label by using this command.

02. When you specify the size, consider the size of the backing paper.

Example CL408e/412e
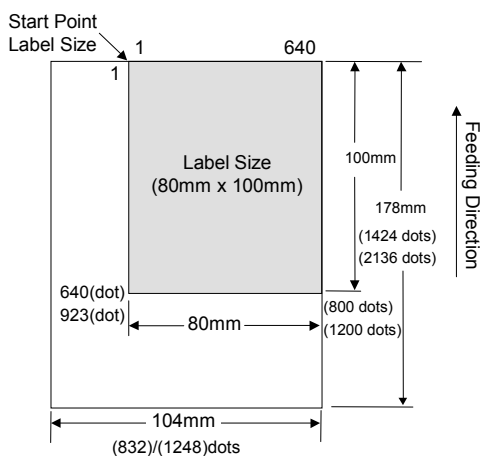
Example of the Label Size Specification Command

<A>

<A1>08000640

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <A1>aaaabbbb

a   "Vertical Label Size" = 1-V Max (dot)

b   "Horizontal Label Size" = 1-H Max (dot)

Model	Horizontal Label Size	Vertical Label Size
CL408e	832	2848
CL412e	1248	4272
M-8400RVe	832	2848
CL608e	1216	3776
CL612e	1984	4272
CT400DT/TT	832	3200
CT410DT/TT	1248	4800
M8485Se	1024 dots	2848
M8490Se	1344 dots	4272
M8460Se	1216 dots	2848
M8459Se	896 dots	2848

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ESC+CS   Print Speed Specification

[Function]

Specifies the print speed.

In general, the print speed is set with the "User Mode" Operation of the printer but you can also temporarily set it with this command.

[Supplement]

01.   This command should be used by differentiating between <A and <Z>.

02.   The value specified with this command is invalid when you turn off the printer and the default value is effective when the printer is restarted.

03.   When you set the default print speed, use the "User Mode" of the printer.

04.   When the setting value saved in the printer is changed, use the PG command.

Example of the Label Speed Specification Command

<A>

<CS>2

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <CS>aa

Model	Print Speed "aa"	Model	Print Speed "aa"
CL408e CL412e	1 : 2 inch/s 2 : 3 inch/s 3 : 4 inch/s 4 : 5 inch/s 5 : 6 inch/s	M-8400RVe (DSW2-8 OFF)	1 : 2 inch/s 2 : 4 inch/s 3 : 6 inch/s 4 : 8 inch/s 5 : 10 inch/s
CL608e CL612e	4 : 4 inch/s 6 : 6 inch/s 8 : 8 inch/s	M-8400RVe (DSW2-8 ON)	1 : 2 inch/s 2 : 3 inch/s 3 : 4 inch/s 4 : 5 inch/s 5 : 6 inch/s

CT400DT/TT	2 : 2 inch/s 3 : 3 inch/s 4 : 4 inch/s 5 : 5 inch/s 6 : 6 inch/s	CT410DT/TT	2 : 2 inch/s 3 : 3 inch/s 4 : 4 inch/s
M8458Se	4 : 4 inch/s 6 : 6 inch/s 8: 8 inch/s 10: 10 inch/s 12 : 12 inch/s	M8460Se	4 : 4 inch/s 6 : 6 inch/s 8 : 8 inch/s
M8490Se	4 : 4 inch/s 6 : 6 inch/s 8 : 8 inch/s	M8459Se	2 : 2 inch/s 3 : 3 inch/s 4 : 4 inch/s 5 : 5 inch/s

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ESC+#E   Print Darkness Specification

[Function]

Specifies the print darkness.

[Supplement]

01.   You should adjust the settings from the "User Mode" of the printer.

02.   The value specified with this command is saved in the printer.

Example of the Print Density Specification Command

<A>

<#E>3

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

Parameter   <#E>ab

a   "Specification of Print Density Level"

b   "Print Density Specification" can only be used with the CT4xx
=   A-F

Model	Print Density "a"	Model	Print Density "a"
CL408e CL412e CT400DT/TT CT410DT/TT M-8400RVe M-8459Se	1 : Light 2 : Medium Light 3 : Normal 4 : Medium Dark 5 : Dark	CL608e CL612e M8485Se M8490Se M8460Se	1 : Light 2 : Normal 3 : Dark

ESC+PG   Printer Operation Registration

[Function]

Registers the printer operation in the EEPROM.

[Supplement]

01.   You should adjust the settings from the "User Mode" of the printer.

02.   The operation setting specified with this command is stored even if you turn off the printer.

[Parameter]   <PG>abcdefghhijklmnooppqqrrstuvwxy

CL4xxe, CL6xxe, M8400RVe, M84xxSe

No.	Item	Description
a	Not Used	00h fixed
b	Not Used	00h fixed
c	Print Speed (Default:02h)	00h 2 inch/s 05h 7 inch/s 01h 3 inch/s 06h 8 inch/s 02h 4 inch/s 07h 9 inch/s 03h 5 inch/s 08h 10 inch/s 04h 6 inch/s 10h 12 inch/s
d	Not Used	00h fixed
e	Not Used	00h fixed
f	Not Used	00h fixed
g	Not Used	00h fixed
h	Print Density Specification (Default:A)	41h A 42h B (Not Used) 43h C (Not Used) 44h D (Not Used) 45h E (Not Used) 46h F (Not Used)
h	Print Density Level (Default:03h)	01h Density 1 02h Density 2 03h Density 3 04h Density 4 05h Density 5
i	Not Used	00h fixed
j	0 Slash	00h disabled 01h enabled
k	Kanji Code (Default:00h)	00h JIS Code 01h Shift-JIS Code
l	Not Used	00h fixed
m	Initial Feed	00h disabled 01h enabled

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No.	Item	Description
n	Proportional Pitch (Default:00h)	00h fixed 01h Proportional Pitch
o	Vertical Label Size (dot)	CL408e : (1 – 2848) CL412e : (1 – 4272) CL608e : (1 – 2848) CL612e : (1 – 4272) M-8400RVe : (1 – 2848)
p	Horizontal Label Size (dot)	CL408e : (1 – 832) CL412e : (1 – 1248) CL608e : (1 – 1216) CL612e : (1 – 1984) M-8400RVe : (1 – 832) M8485Se : (1 – 1024) M8490Se : (1 – 1344) M8460Se : (1 – 1216) M8459Se : (1 – 896)
q	Vertical Start Point Correction Value (dot)	[0 – 792] [-1 – -792]
r	Horizontal Start Point Correction Value (dot)	[0 – 792] [-1 – -792]
s	Not Used	00h fixed
t	Not Used	00h fixed
u	Not Used	00h fixed
v	Not Used	00h fixed
w	Not Used	00h fixed
x	Space between Labels (dot)	[0 – 64]
y	Alarm Sound Setting	00h On 01h Off

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CT400DT/TT, CT410DT/TT

No.	Item	Description
a	Not Used	00h fixed
b	Not Used	00h fixed
c	Print Speed (Default:02h)	00h 2 inch/s 01h 3 inch/s 02h 4 inch/s 03h 5 inch/s (CT400DT/TT only) 04h 6 inch/s (CT400DT/TT only)
d	Not Used	00h fixed
e	Cutter Operation	00h Operation 1 (Head position) 01h Operation 2 (Cutter position) 02h Operation 3 (Without back feed)
f	Dispenser Operation	00h Operation 1 (Head position) 01h Operation 2 (Dispenser position)
g	Linerless Operation	00h Linerless (Cutter position) 01h Linerless (Back feed)
h	Print Density Specification (Default:A)	41h A 42h B 43h C 44h D 45h E 46h F
h	Print Density Level (Default:03h)	01h Density 1 02h Density 2 03h Density 3 04h Density 4 05h Density 5
i	Sensor Type	00h Reflection sensor 01h Transparent sensor 02h Sensor ignore type
j	0 Slash	00h disabled 01h enabled
k	Kanji Code (Default:00h)	00h JIS Code 01h Shift-JIS Code
l	Label type Specification	00h Adhesive Label 01h Non-adhesive Tag
m	Initial Feed	00h disabled 01h enabled
n	Proportional Pitch (Default:00h)	00h Fixed pitch 01h Proportional pitch

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No.	Item	Description
o	Vertical Label Size (dot)	CT400DT/TT : (1 – 3200) CT410DT/TT : [01h – 12c0h] (1 – 4800)
p	Horizontal Label Size (dot)	CT400DT/TT : (1 – 832) CT410DT/TT : (1 – 1248)
q	Vertical Start Point Correction Value (dot)	[0 – 792] [-1 – -792]
r	Horizontal Start Point Correction Value (dot)	[0 – 792] [-1 – -792]
s	Label pitch offset (dot)	[0 – 63] [-1 – -99]
t	TearOff offset (dot)	[0 – 63] [-1 – -99]
u	Cutter offset (dot)	[0 – 63] [-1 – -99]
v	Dispenser offset (dot)	[0 – 63] [-1 – -99]
w	Control Code Specification	00h Standard Code 01h Non-standard Code
x	Gap between Labels (dot)	[0 – 64]
y	Alarm Sound Setting	00h On 01h Off

ESC+A3   Start Point Correction Specification

[Function]

Specifies the change of the start point coordinate.

[Supplement]

01.   You should adjust the settings from the "User Mode" of the printer.

Example of the Start Point Correction Specification Command

<A>

<A3>V10H10

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]<A3>VaaaaHbbb

a   "Vertical direction (dot)" = 1-V Max

b   "Horizontal direction (dot)" = 1-H Max
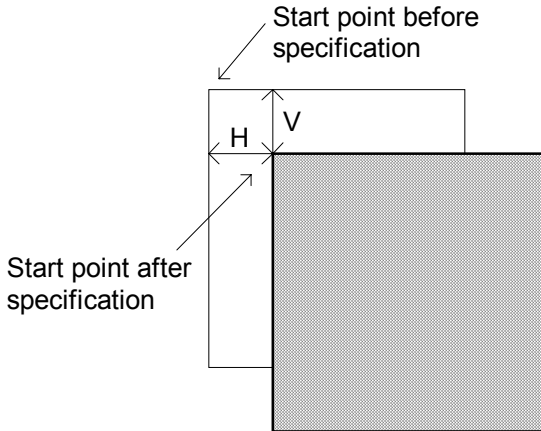
Model	Vertical Label Size (dot)	Horizontal Label Size (dot)
CL408e	1424	832
CL412e	2136	1248
M-8400RVe	1424	832

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CL608e	1424	1216
CL612e	2136	1984
CT400DT/TT	3200	832
CT410DT/TT	4800	1248
M8485Se	1424	1024
M8490Se	2136	1344
M8460Se	1424	1216
M8459Se	1424	896

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ESC+* Clear Specification

[Function]

Clears the registered information in the printer memory.

[Supplement]

01. This command should be used by differentiating between <A> and <Z>.

02. This command does not clear the data while printing.

03. This command is effective between items.

04. Each data transferred before executing All Clear with this command is deleted by sending the All Clear (a=X) of this command when the printer is set to the Multiple Reception Mode.

05. In this case, the Custom-design character registration and overlay are also cleared.

Only for ESC+* <*>

One Item = Receive buffer/Drawing buffer (it is not issued again)

Multiple Item = Reception buffer/Drawing buffer (JOB is cleared while printing)

Example of the Clear Specification Command

<A>

<*>X

<Z>

For the internal memory clear <*a>

a = Clear Item Specification

T: Custom-design character Registration area

&: Form Overlay Buffer

X: All Clear (Reception Buffer, Edit Buffer, Custom-design character Registration, Form Overlay)

* However, the print job cannot be cleared while printing.

F: Font Registration Area

ESC+FC Font Delete Specification

[Function]

Specifies the deletion of the fonts registered in the internal memory.

[Supplement]

01.   This command should be used to differentiate between <A> and <Z>.

Example of the Font Delete Specification Command.

<A>

<FC>01

<Z>

[Parameter]   <FC>aa

a   "Font ID Number"= 01-99

ESC+@   Off-line Specification

[Function]

Changes the printer's status from on-line to off-line.

[Supplement]

01.   This command should be used by differentiating between
        <A> and <Z>.

02.   Use One Item for the printer reception mode.

Example of the Off-line Specification Command

<A>

<@>, load Blue Labels

<Z>

[Parameter]   <@>, a~a

a   The message appears on the printer's LCD.
        It is possible to insert a maximum of 32 digits.

ESC+2S   Two Color Print Area Specification

[Function]

Specifies the two color print area.

This command works only with CT4xx DT.

Special 2-color thermal material is required!

[Supplement]

01.   This command should be used with the Label Size Specification <A1> command.

02.   Up to 10 areas of two color print can be registered.

03.   The print quality is affected by the Print Speed Specification and Print Density Specification.

04.   SATO does not guarantee the quality of the barcode printed with the two color print.

[Note]

For 2mm inside from the printed area, two colors print may not be printed clearly.
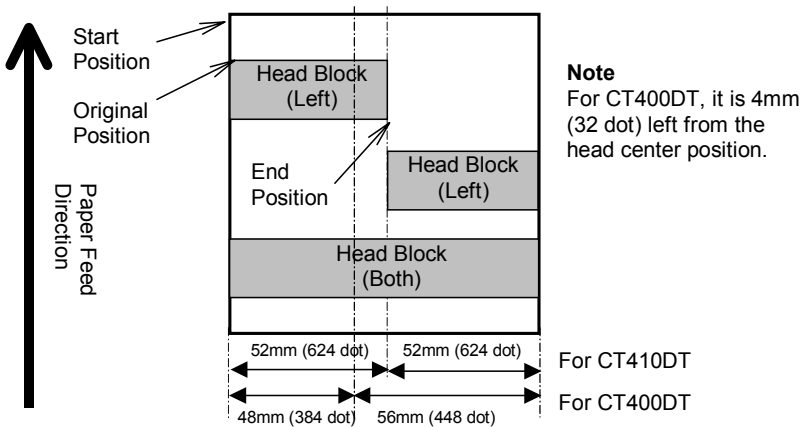
Example of the Two Color Print Area Specification Command

<A>

<V>100<H>200<P>2<L>0202<X22>ABCD

<2S>2V0001Y0892

<Q>2

<Z>

[Parameter]   <2S>aVbbbbYcccc

a   "Head Block Specification" =   0: Left

                                     1: Right

                                     2: Both

b   "Start Vertical position" =   1-Label Vertical Size

c   "End Vertical position" =   1-Label Vertical Size

ESC+PO   Offset Specification

[Function]

Specifies the label stop position for each operation.

This command works only with the CT series.

[Supplement]

01.   Adjust the position by moving the printer volume.

02.   You do not have to use this command for regular label printing.

03.   Use this command when you experience some specific offset.

Example of the Offset Specification Command

<A>

<PO>3+08

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <PO>abcc

a "Offset Specification" =   0: Cutter Operation

                                        1: Dispenser Operation

                                        2: Tear Off Operation

                                        3: Continuous Operation

b "Offset Direction Specification" = "+/-" Selection

c "Offset Amount Specification" =   00-99dots

ESC+TG   Space Size between Labels Specification

[Function]

Specifies the gap size between labels.

[Supplement]

01.   The standard gap size between labels is 3mm.

02.   For a non-adhesive tag, you do not have to specify the gap.

03.   You do not have to specify this command.

Example of the Space Size between Labels Specification Command

<A>

<TG>36

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <TG>aa

a "Space size between labels" =   0-64 (dot)

8dot/mm (Default:24)

12dot/mm (Default:36)

Space between labels

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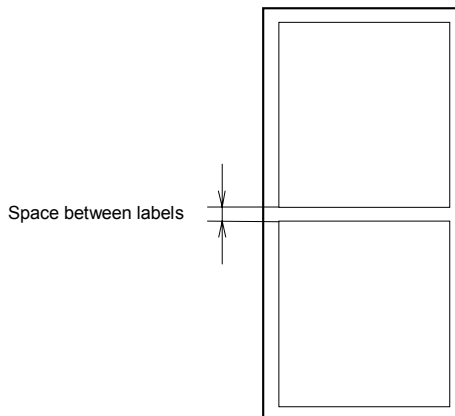
ESC+IG   Sensor Type Specification

[Function]

Specifies the sensor type.

Except for CT series, this command is specified by using the printer Dip Switches.

[Supplement]

01.   You do not have to specify this command for regular label printing.

Example of the Sensor Type Specification Command

<A>

<IG>0

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <IG>a

a   "Sensor Type Specification" =0: Reflection sensor

                                    1: Transparent sensor (Space)

                                    2: Sensor not used

ESC+PH   Print Method Specification

[Function]

Specifies the print method.

This command is specified by using Dip Switches of the printer.

[Supplement]

01.   You do not have to specify this command for regular label printing.

Example of the Print Method Specification Command

<A>

<IG>0

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>2

<Z>

[Parameter]   <PH>a

a   "Print Method Specification" =   0: Thermal Transfer

1: Direct Thermal

ESC+PM   Operation Mode Specification

[Function]

Specifies the operation mode.

This command is specified by using Dip Switches of the printer.

[Supplement]

01.   You do not have to specify this command for regular label printing.

[Parameter]   <PM>a

a   "Operation Mode Specification" =

            0: Continuous Operation

            1: Tear Off Operation

            2: Cutter Operation (Head position)

            3: Cutter Operation (Cutter position)

            4: Cutter Operation (without back feed)

            5: Linerless Operation (Cutter position)

            6: Linerless Operation (without back feed)

            7: Dispenser Operation (Head position)

            8: Dispenser Operation (Dispenser position)

ESC+C   Reissue Specification

[Function]

Specifies reissuing the previously printed contents.

[Supplement]

01.   This command does not take effect if you turn off the printer and the contents are cleared.

Example of the Reissue Specification Command

<A>

<C>

<Z>

ESC+RF Font/Graphik Recall Print Specification

[Function]

Searches and prints the downloaded font or logo.

[Supplement]

01. Specify a value where the higher byte of Unicode is replaced with the lower byte for printing.

02. When accessing and printing the graphik, specify the following:
"Print Digit Number : 0002", "Print Data : <826B>16".

03. Use ideally the Memory Card Compiler from the Dynamic Aviator Label Suite to store or delete a font or graphic.

04. You can find a font ID for the downloaded font or logo from the "Font ID" item of the dialog box by selecting [Maintenance]-[Download Logo/Font Maintenance] from [Font Create Tool], [Logo Create Tool] or [Download Tool] menu.

[Parameter]   <RF>aabbbb, n-n

a   "Font ID Number"

b   "Print Digit Number"

n   "Print Data"

Example of the Font/Logo Search Print Specification Command

1)   When a single byte "AB" is printed by using the Font Recall Print function.

(For Unicode: A: $<0041>_{16}$B: $<0042>_{16}$)

<A>

<PS><V>100<H>100<L>0101<RF>010004,

$<0041>_{16}<0042>_{16}$

<Z>

2)   When Graphic Recall Print is used.

<A>

<V>100<H>100<L>0101<RF>020002, $<826B>_{16}$

<Z>

ESC+YE   Paper Type Specification

[Function]

Specifies the label type.

This command works only with for CT series.

[Supplement]

01.   When you turn off the printer, all specified values are invalid and the registered values in the printer are valid when the printer is restarted.

[Parameter]   <YE>a

a   "Paper Type Specification" =

   0: Non-adhesive Label

   1: Non-adhesive Tag

Example of the Paper Type Specification Command

<A>

<YE>0

<V>100<H>200<P>2<L>0202<XM>ABCD

<Q>4

<Z>

ESC+AX   Print Area Enlargement Specification

[Function]

Enlarges the vertical size of the print area.

[Supplement]

This command works not with the CT4xx.

01.   Enlarges the print area of the pitch direction.

02.   This command should be placed after <A> command.

03.   When using this command, the print area will return to its standard size when the printer is turned off.

Example of the Print Area Enlargement Specification Command.

<A>

<AX>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Z>

[Parameter]   <AX>

Standard print area

Enlarged print area

	Printer Model	Printing Resolution (Head Density)	Maximum Printing Area	
			Standard Height	Enlarged Height
1	CL408e	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
2	CL412e	300dpi (12dot/mm)	178mm (2136dot)	356mm (4272dot)
3	M-8400RVe	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
4	CL608e	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
5	CL612e	300dpi (12dot/mm)	178mm (2136dot)	356mm (4272dot)

6	M8485Se	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
7	M8490Se	300dpi (12dot/mm)	178mm (2136dot)	356mm (4272dot)
8	M8460Se	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
9	M8459Se	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)

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ESC+AR   Print Area Standard Specification

[Function]

This command returns the print area from command <AX> back to its standard size.

[Supplement]

This command works not with the CT4xx

01.   This command should be placed after the <A> command.

Example of the Print Area Standard Specification Command.

<A>

<AR>

<V>100<H>200<P>2<L>0202<M>ABCD

<Z>

[Parameter]   <AR>

Standard print area

Enlarged print area

	Printer Model	Printing Resolution (Head Density)	Maximum Printing Area	
			Standard Height	Enlarged Height
1	CL408e	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
2	CL412e	300dpi (12dot/mm)	178mm (2136dot)	356mm (4272dot)
3	M-8400RVe	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
4	CL608e	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
5	CL612e	300dpi (12dot/mm)	178mm (2136dot)	356mm (4272dot)
6	M8485Se	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)

7	M8490Se	300dpi (12dot/mm)	178mm (2136dot)	356mm (4272dot)
8	M8460Se	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)
9	M8459Se	203dpi (8dot/mm)	178mm (1424dot)	356mm (2848dot)

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ESC+EP   Final Position Print Specification

[Function]

Specifies the final stop position for continous material (sensor not used).

[Supplement]

01.   This command must be placed after the Label Size Specification command <A1>.

02.   The final stop position will be the vertical label size specified by the Label Size Specification command, regardless of what is actually printed.

Example of the Final Position Print Specification Command.

<A>

<A1>14240832

<EP>

<V>100<H>200<P>2<L>0202<XM>ABCD

<Z>

Model	Horizontal Label Size	Vertical Label Size
CL408e	832	2848
CL412e	1248	4272
M-8400RVe	832	2848
CL608e	1216	2848
CL612e	1984	4272
CT400DT/TT	832	3200
CT410DT/TT	1248	4800

ESC+I2   Serial Interface Settting

[Function]

This command can only be used with CT4xx.

This command specifies the serial setting.

[Supplement]

01.   The value specified with this command become functional
        when you turn off the power and restart the printer.

[Parameter]ESC+I2abcde

a	"Baud rate"	30h = 9600bps
		31h = 19200bps
		32h = 38400bps
		33h = 57600bps
b	"Data bit"	30h = 8bit
		31h = 7bit
c	"Parity"	30h = Non parity
		31h = Odd parity
		32h = Even parity
d	"Stop bit"	30h = 1bit
		31h = 2bit
e	"Control"	30h = ER control (single item)
		31h = ER control (multi item)
		32h = Xon-Xoff
		33h = Status 4
		34h = Status 3

ESC+I1 IEEE 1284 Settting

[Function]

This command specifies the reception mode and ACK width of the IEEE1284.

This command can be used with CT series only.

[Supplement]

01. This command does not have to be specified.

02. This command cannot be used with the MR400e, MR600e and M-4800RVe series.

[Parameter] ESC+I1ab

a "Reception mode (Default: 0)" 0: Multiple Reception

1: One Item Reception

b "ACK width specification" Valid range: 010 - 200 (1 = 50ns)

ESC+WT Calendar Setup Specification

[Function]

Sets the calendar (the year, the month and the day).

[Supplement]

This command works not with the CT4xx

01.   This command should be used for differentiating between <A> and <Z>.

02.   This command requires a RTC.

Example of the Calendar Setup Specification Command.

<A>

<WT>0012251300

<Z>

[Parameter]   <WT>aabbccddee

a   "Year Setup" =   Valid Range : 00-99

b   "Month Setup" = Valid Range : 01-12

c   "Day Setup" =   Valid Range : 01-31

d   "Time Setup" =   Valid Range : 00-23

e   'Minute Setup" = Valid Range : 00-59

ESC+WP   Date Offset Specification

[Function]

Specifies a Date Offset.

[Supplement]

This command works not with the CT4xx

01.   This command requires a RTC.

02.   It's possible to specify only one type of added heading.

03.   It is valid for the last specified command.

Example of the Date OffsetSpecification Command.

<A>

<WP>M03

<V>100<H>200

<XM><WA>DD/MM/YY

<Q>2

<Z>

[Parameter]   <WP>abbb

a	"Year/Month/Day/Hour Setup"	= Y : Year
		= M : Month
		= D : Day
		= h: Hour
b	"Year, Month, Day and Time Range Setup Y Valid Range Specification"	= 0-9
		M = 00-99
		D = 000-999
		h = 000-999

ESC+WA Real Time Clock Specification (Real Time Method)

[Function]

Specifies the printing of the Calendar.

[Supplement]

This command works not with the CT4xx

01. When the printer is set for multiple prints like <Q> = 100, the calendar data will be updated on each page.

02. Within one form, it is possible to specify up to 6 places the Calendar Print command.

03. The calendar print data will be maximum 16 characters.

04. This command requires a RTC.

05. The type of character should be specified before <WA>.

06. Partly copying the calendar print data or black/white inversion is not possible.

Example of the Calendar Print Specification Command.

<A>

<WP>M03

<V>100<H>200

<XM><WA>DD/MM/YYhh : mm

<Q>2

<Z>

[Parameter]   <WA>a

a   "Specification of the Real Time Clock date to be printed"

  YYYY: Year 4-digits

  YY   Year 2-digits

  MM   Month 2-digits

  DD   Day 2-digits

  hh   Hour 2-digits 24hour format

  HH   Hour 2-digits 12hour format

  mm   Minutes 2- digits

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ss	Seconds 2-digits
TT	Time Period (AM/PM)
JJJ	Julian Date 3-digits
ww	Week number 2-digits
WW	Week number -1 (depending on 1st day of the year), 2-digits

3.   Font Character Set

3.1   XU Font Character Set

Characters composed with the basic size 5 x 9 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				Ø	@	P	`	p	Ç	é	á			ð	ó	–
1			!	1	A	Q	a	q	ü	æ	í			Đ	β	±
2			"	2	B	R	b	r	é	Æ	ó			ê	ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	š	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	ã	î		
8			(	8	H	X	h	x	ê	ÿ	¿	©		ï		°
9			)	9	I	Y	i	y	ë	Ö					ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				ô	•
B			+	;	K	[	k	{	ï	ø	½				ù	'
C			,	<	L	\	l			î	£	¼				ý	³
D			–	=	M	]	m	}	ì	Ø	¡	¢			ý	²
E			.	>	N	^	n	‾	Ä	×	«	¥		ì	¯	
F			/	?	O	_	o			Å	ƒ	»				´	

The above printed sample is 5x in both the vertical and horizontal direction.

3.2   XS Font Character Set

Characters composed with the basic size 17 x 17 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á			ð	Ó	-
1			!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	‗
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	·
B			+	;	K	[	k	{	ï	ø	½				Ù	¹
C			,	<	L	\	l	|	î	£	¼				ý	³
D			-	=	M	]	m	}	ì	Ø	¡	¢		¦	Ý	²
E			.	>	N	^	n	~	Ä	×	«	¥		Ì	¯	
F			/	?	O	_	o		Å	ƒ	»				´	

The above printed sample is 2x in both the vertical and horizontal direction.

3.3 XM Font Character Set

Characters composed with the basic size 24 x 24 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	0			ð	Ó	‾
1			!	1	A	Q	a	q	ü	æ	í				Ð	β	±
2			"	2	B	R	b	r	é	Æ	ó				Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú				Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ				È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á			€	Õ	§
6			&	6	F	V	f	v	ã	û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©			Ï	Þ	°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨	
A			*	:	J	Z	j	z	è	Ü	¬				Û	·	
B			+	;	K	[	k	{	ï	ø	½			■	Ù	¹	
C			,	<	L	\	l	¦	î	£	¼				ý	³	
D			-	=	M	]	m	}	ì	ø	¡	¢		¦	Ÿ	²	
E			.	>	N	^	n	~	Ä	×	«	¥		Î	‾		
F			/	?	O	_	o		Å	ƒ	»				´		

The above printed sample is 2x in both the vertical and horizontal direction.

3.4 XB Font Character Set

Characters composed with the basic size 48 x 48 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	Ø		ð	Ó	¯
1			!	1	A	Q	a	q	ü	æ	í			Ð	β	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			Ê	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	Ö	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï	þ	°
9			)	9	I	Y	i	y	ë	Ö	®			Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬			Û	·
B			+	;	K	[	k	{	ï	ø	½		■	Ù	¹
C			,	<	L	\	l	¦	î	£	¼			ý	³
D			¯	=	M	]	m	}	ì	ø	¡	¢		¦	Ý	²
E			.	>	N	^	n	~	Ä	×	«	¥		Î	¯	
F			/	?	O	_	o		Å	ƒ	»			´		

The above printed sample is 1x in both the vertical and horizontal direction.

3.5 XL Font Character Set

Characters composed with the basic size 48 x 48 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á			ð	ó	−
1			!	1	A	Q	a	q	ü	æ	í			Ð	β	±
2			"	2	B	R	b	r	é	Æ	ó			ê	ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	š	§
6			&	6	F	V	f	v	á	û	ª	Â	ã	í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	ã	î		
8			(	8	H	X	h	x	ê	ÿ	¿	©		ï		°
9			)	9	I	Y	i	y	ë	Ö					Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	•
B			+	;	K	[	k	{	ï	ø	½				Ù	¦
C			,	<	L	\	l	|	î	£	¼				ý	³
D			−	=	M	]	m	}	ì	Ø	¡	¢			Ý	²
E			.	>	N	^	n	¯	Ä	×	«	¥			þ	¹
F			/	?	O	_	o		Å	ƒ	»				´	

The above printed sample is 1x in the vertical and horizontal direction.

3.6 U Font Character Set

Characters composed with the basic size 5 x 9 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á			ð	ó	–
1			!	1	A	Q	a	q	ü	æ	í			Đ	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	Ħ
4			$	4	D	T	d	t	ä	ö	ñ			È	Õ	
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	ő	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	í	μ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	î		
8			(	8	H	X	h	x	ê	ÿ	¿	©		ï		°
9			)	9	I	Y	i	y	ë	Ö				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬			Û	•
B			+	;	K	[	k	{	ï	ø	½			Ù	¦
C			,	<	L	\	l	|	î	£	¼			ý	³
D			-	=	M	]	m	}	ì	Ø	¡	¢		Ý	²
E			.	>	N	^	n	¯	Ä	×	«	¥		ì	⁻
F			/	?	O	_	o		Å	ƒ	»			·

The above printed sample is 5x in both the vertical and horizontal direction.

3.7   S Font Character Set

Characters composed with the basic size 8 x 15 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á			ð	ó	—
1			!	1	A	Q	a	q	ü	æ	í			Đ	β	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	š	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	í	µ	÷
7			´	7	G	W	g	w	ç	ù	º	à	Ã	î		
8			(	8	H	X	h	x	ê	ÿ	¿	©		ï		°
9			)	9	I	Y	i	y	ë	Ö					ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	•
B			+	;	K	[	k	{	ï	ø	½				Ù	¦
C			,	<	L	\	l	|	î	£	¼				ý	³
D			-	=	M	]	m	}	ì	Ø	¡	¢			Ý	²
E			.	>	N	^	n	‾	Ä	×	«	¥		þ	¯	
F			/	?	O	_	o		Å	ƒ	»				´	

The above printed sample is 2x in both the vertical and horizontal direction.

3.8 M Font Character Set

Characters composed with the basic size 13 x 20 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				Ø	@	P	`	p	Ç	É	á			ð	ó	–
1			!	1	A	Q	a	q	ü	æ	í			Ð	β	±
2			"	2	B	R	b	r	é	Æ	ó			ê	ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	ò	¤
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	ŏ	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	í	µ	÷
7			´	7	G	W	g	w	ç	ù	º	À	ã	î		
8			(	8	H	X	h	x	ê	ÿ	¿	©		ï		°
9			)	9	I	Y	i	y	ë	Ö					ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				û	•
B			+	;	K	[	k	{	ï	ø	½				ù	¦
C			,	<	L	\	l	|	î	£	¼				ý	³
D			–	=	M	]	m	}	ì	Ø	¡	¢			Ý	²
E			.	>	N	^	n	‾	Ä	×	«	¥		ì	¯	
F			/	?	O	_	o		Å	ƒ	»				´	

The above printed sample is 2x in both the vertical and horizontal direction.

3.9   WB Font Character Set

Characters composed with the basic size 18 x 30 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á			ð	ó	-
1			!	1	A	Q	a	q	ü	æ	í			Đ	β	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	
5			%	5	E	U	e	u	à	Ò	Ñ	Á		€	õ	§
6			&	6	F	V	f	v	å	Û	ª	Â	ã	í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î		
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï		°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Ô	·
B			+	;	K	[	k	{	ï	ø	½				Ù	¹
C			,	<	L	\	l	|	î	£	¼				ý	³
D			-	=	M	]	m	}	ì	Ø	¡	¢			Ý	²
E			.	>	N	^	n	~	Ä	X	«	¥		Ì	¯	
F			/	?	O	_	o		Å	ƒ	»				´	

The above printed sample is 1x in both the vertical and horizontal direction.

3.10　WL Font Character Set

Characters composed with the basic size 28 x 52 dots.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	'	p	Ç	É	á			ð	ó	-
1			!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	
5			%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	§
6			&	6	F	V	f	v	å	Û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	Ù	º	À	Ã	Ï		
8			(	8	H	X	h	x	ê	ÿ	¿					°
9			)	9	I	Y	i	y	ë	Ö	®			Ú		¨
A			*	:	J	Z	j	z	è	Ü	¬			Û		·
B			+	;	K	[	k	{	ï	ø	½			Ù		¹
C			,	<	L	\	l	¦	î	£	¼			ý		³
D			-	=	M	]	m	}	ì	Ø	¡	¢		Ý		²
E			.	>	N	^	n	~	Ä	×	«	¥		Î		¯
F			/	?	O	_	o		Å	ƒ	»				´	

The above printed sample is 1x in both the vertical and horizontal direction.

3.11 OCR-A Font Character Set

OCR-A Style Character Specification (Alphanumeric and symbol)

Character Structure: 15 x 22 dots

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0		P										
1				1	A	Q										
2				2	B	R										
3				3	C	S										
4			$	4	D	T										
5				5	E	U										
6				6	F	V										
7				7	G	W										
8				8	H	X										
9				9	I	Y										
A					J	Z										
B					K											
C					L											
D					M											
E			.	>	N											
F			/		◊											

The above printed sample is 1x in both the vertical and horizontal direction.

TOC

3.12 OCR-B Font Character Set

OCR-B Style Character Specification (Alphanumeric and symbol)

Character Structure: 20 x 24 dots

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P										
1			!	1	A	Q										
2			"	2	B	R										
3			#	3	C	S										
4			$	4	D	T										
5			%	5	E	U										
6			&	6	F	V										
7			'	7	G	W										
8			(	8	H	X										
9			)	9	I	Y										
A			*	:	J	Z										
B			+	;	K	¥										
C			,	<	L	¥										
D			−	=	M											
E			.	>	N											
F			/	?	O											

The above printed sample is 1x in both the vertical and horizontal direction.

4.   Barcode Table

4.1   Codabar Code Table

					S			I				S			O			
				b4	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b3	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b2	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0												
0	0	0	1	**1**				1	A		a									
0	0	1	0	**2**				2	B		b									
0	0	1	1	**3**				3	C		c									
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**				5	E		e									
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**			*	:												
1	0	1	1	**B**			+													
1	1	0	0	**C**																
1	1	0	1	**D**			-													
1	1	1	0	**E**			.		N		n									
1	1	1	1	**F**			/													

4.2 CODE-39 Code Table

						S				I				S				O			
				b4	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b3	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b2	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0		P										
0	0	0	1	**1**				1	A	Q										
0	0	1	0	**2**				2	B	R										
0	0	1	1	**3**				3	C	S										
0	1	0	0	**4**			$	4	D	T										
0	1	0	1	**5**			%	5	E	U										
0	1	1	0	**6**				6	F	V										
0	1	1	1	**7**				7	G	W										
1	0	0	0	**8**				8	H	X										
1	0	0	1	**9**				9	I	Y										
1	0	1	0	**A**			*		J	Z										
1	0	1	1	**B**			+		K											
1	1	0	0	**C**					L											
1	1	0	1	**D**			-		M											
1	1	1	0	**E**			.		N											
1	1	1	1	**F**			/		O											

4.3 Interleaved 2/5, Matrix 2/5, Industrial 2/5, UPC, EAN, UPC-E Code Table

					S				I				S				O			
				b4	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b3	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b2	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

4.4 CODE-93 Code Table

						S			I							S			O		
				b4	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b3	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b2	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			"	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			'	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	¥	l										
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

4.5   CODE-128 Character Code Table

Value	CODE A	CODE B	CODE C
0	SP	SP	00
1	!	!	01
2	”	”	02
3	#	#	03
4	$	$	04
5	%	%	05
6	&	&	06
7	,	,	07
8	(	(	08
9	)	)	09
10	*	*	10
11	+	+	11
12	,	,	12
13	-	-	13
14	.	.	14
15	/	/	15
16	0	0	16
17	1	1	17
18	2	2	18
19	3	3	19
20	4	4	20
21	5	5	21
22	6	6	22
23	7	7	23
24	8	8	24
25	9	9	25
26	:	:	26
27	;	;	27
28	<	<	28
29	=	=	29
30	> (Note 4)	> (Note 4)	30
31	?	?	31
32	@	@	32
33	A	A	33
34	B	B	34
35	C	C	35
36	D	D	36
37	E	E	37
38	F	F	38
39	G	G	39
40	H	H	40
41	I	I	41
42	J	J	42
43	K	K	43
44	L	L	44
45	M	M	45
46	N	N	46
47	O	O	47
48	P	P	48

Value	CODE A		CODE B		CODE C
49	Q		Q		49
50	R		R		50
51	S		S		51
52	T		T		52
53	U		U		53
54	V		V		54
55	W		W		55
56	X		X		56
57	Y		Y		57
58	Z		Z		58
59	[		[		59
60	\		\		60
61	]		]		61
62	^		^		62
63	_		¯		63
64	NUL	>SP	`	>SP	64
65	SOH	>!	a	>!	65
66	STX	>"	b	>"	66
67	ETX	>#	c	>#	67
68	EOT	>$	d	>$	68
69	ENQ	>%	e	>%	69
70	ACK	>&	f	>&	70
71	BEL	>'	g	>'	71
72	BS	>(	h	>(	72
73	HT	>)	i	>)	73
74	LF	>*	j	>*	74
75	VT	>+	k	>+	75
76	FF	>,	l	>,	76
77	CR	>-	m	>-	77
78	SO	>.	n	>.	78
79	SI	>/	o	>/	79
80	DLE	>0	p	>0	80
81	DC1	>1	q	>1	81
82	DC2	>2	r	>2	82
83	DC3	>3	s	>3	83
84	DC4	>4	t	>4	84
85	NAK	>5	u	>5	85
86	SYN	>6	v	>6	86
87	ETB	>7	w	>7	87
88	CAN	>8	x	>8	88
89	EM	>9	y	>9	89
90	SUB	>:	z	>:	90
91	ESC	>;	{	>;	91
92	FS	><	|	><	92
93	GS	>=	}	>=	93
94	RS	>>	~	>>	94
95	US	>?	DEL	>?	95
96	FNC3	>@	FNC3	>@	96
97	FNC2	>A	FNC2	>A	97

Value	CODE A	CODE B	CODE C
98	SHIFT >B	SHIFT >B	98
99	CODE-C>C	CODE-C>C	99
100	CODE-B>D	FNC4 >D	CODE-B>D
101	FNC4 >E	CODE-A>E	CODE-A>E
102	FNC1 >F	FNC1 >F	FNC1 >F
103	START CODE A >G		
104	B >H		
105	C >I		

Note:

1. The Start code must be sent.

2. The Stop code is automatically added by the printer.

3. Code values higher than 64 for CODE A and B are specified as a two-character code added with >.

4. The ">" specified code should be ">J".

4.6   Customer Barcode Table

b4	b3	b2	b1		S				I				S				O			
			b4		0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
			b3		0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
			b2		0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
			b1		0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0		P										
0	0	0	1	**1**				1	A	Q										
0	0	1	0	**2**				2	B	R										
0	0	1	1	**3**				3	C	S										
0	1	0	0	**4**				4	D	T										
0	1	0	1	**5**				5	E	U										
0	1	1	0	**6**				6	F	V										
0	1	1	1	**7**				7	G	W										
1	0	0	0	**8**				8	H	X										
1	0	0	1	**9**				9	I	Y										
1	0	1	0	**A**					J	Z										
1	0	1	1	**B**					K											
1	1	0	0	**C**					L											
1	1	0	1	**D**			-		M											
1	1	1	0	**E**					N											
1	1	1	1	**F**					O											

5.   Two Dimensional Code

ESC+2D10   2D Code PDF417

[Function]
Specifies the 2D Code PDF417.

Example of the 2D Code PDF417 Specification Command
<A>
<V>100<H>200<2D10>, 03, 09, 3, 03, 18
<DN>0010, 0123456789
<Q>2
<Z>

Print position
The print start position is the top left corner with <V> and <H>.
<V>100<H>200<2D10>***…....**
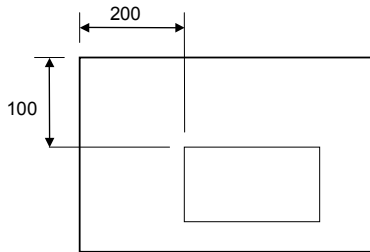
[Parameter]   ESC+2D10, aa, bb, c, dd, ee (, f)

a "Minimum module width (dot number)" Valid Range: 01-09
   * 01 and 02 can be specified but may not be read.
b "Minimum module height (dot number)" Valid Range: 01-24
   * 01, 02 and 03 can be specified but may not be read.
c "Security level" Valid Range: 0-8
d "Data code word per line" Valid Range: 01-30
   00: Automatic (the width varies according to the specified
   data number)

e "Line number per symbol" Valid Range: 03-90

   00: Automatic (the height varies according to the specified data number)

f "Code type" 0: Regular

                1: Retrenchment type (can be omitted; default is 0)

* If e=d=00, the vertical/horizontal size (aspect ratio) is 1: 2 according to the specified data number.

* If the specification of "e" and "d" does not match with the data number, printing may fail.

* When you set a higher security level, you also specify a larger value for "e" or "d".

[Data]   ESC+DNmmmm, n-n

m   "Data number" Valid Range: 0001-2681

n   "Print data"

*Although the maximum data digit number is 2681, the settings vary according to the following specification.

1) Minimum module size

2) Security level

3) Print data type

*If the above mentioned parameter is not specified or data is not matched, printing may not be executed.

Note:

1.   A sequential number cannot be used.

2.   A print position with automatic line feeding function cannot be specified.

3.   The print data can be specified.

4.   The Printer Head Check function can be used.

5.   Format registration can be used.

6.   R (rotation) printing can be used.

7.   When the print quality ratio increases, set a higher minimum module size.

8.   When the read ratio increases, set a higher security level.

9.   The print height varies if only alphabet or only numeric characters are used or if alphanumeric characters are used.

Interface Precaution

When binary data (Kanji, etc.) is registered as a PDF417 symbol, take into consideration the following:

[Connect the printer and host using a RS-232C]

Description

Although a regular printer handles JIS Kanji code, some host computers use Shift-JIS Kanji code. The differences are automatically converted via the centronics interface.

Therefore, the data is not sent to the SATO printer correctly. This may lead to printing problems, for example, printing might not be executed or the contents are changed.

Sample

When you use MS-DOS on NEC PC-9801, the Kanji output of centronics is converted to a Kanji code for the NEC printer.

(For more information on the above mentioned operation, refer to the MS-DOS User Reference Manual.)

In order to avoid this, you must create a program to control the printer port directly. This requires knowledge on host computer hardware and OS.

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ESC+BQ   2D Code PDF417 (RISC Compatible)

[Function]

Specifies the 2D Code PDF417.

Example of the 2D Code PDF417 Specification Command

<A>

<V>100<H>200<BK>0309303180010PDF1234567

<Q>2

<Z>

Print position

The print start position is the top left corner with <V> and <H>.

<V>100<H>200<BK>***….**
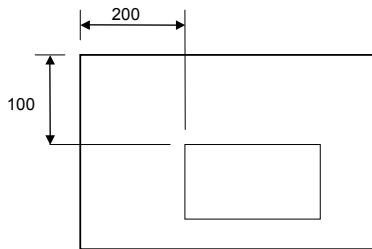
[Parameter] ESC+BKaabbcddeeffffg~g

- a "Minimum module width (dot number)" Valid Range: 01-09
  *01 and 02 can be specified but may not be read.
- b "Minimum module height (dot number)" Valid Range: 01-24
  *01, 02 and 03 can be specified but may not be read.
- c "Security level" Valid Range: 0-8
- d "Data code word per line" Valid Range: 01-30
  00: Automatic (the width varies according to the specified data number)
- e "Line number per symbol" Valid Range: 03-90
  00: Automatic (the height varies according to the specified data number)
- f "Data number" Valid Range: 0001-2681
- g "Print data"

* If e=d=00, the vertical/horizontal size (aspect ratio) is 1:2 according to the specified data number.

* If the specification of "e" and "d" does not match with the data number, printing may fail.

* When you set a higher security level, you also specify a larger value for "e" or "d".

* Although the maximum data digit number is 2681, the settings varies according to the following specification.

    1) Minimum module size

    2) Security level

    3) Print data type

* If the above mentioned parameter is not specified or data is not matched, printing may not be executed.

ESC+2D20   2D Code MAXI Code

[Function]

Specifies the 2D Code MAXI Code.

Example of the 2D Code MAXI Code

<A>

<V>100<H>200<2D20>, 2, 003, 081, 123456789

<DN>0010, 0123456789

<Q>2

<Z>

[Parameter]   ESC+2D20, a (, bbb, ccc, d-d)

a   "Mode" = 2: For transfer only

             = 3: For transfer only

             = 4: Standard symbol

             = 6: For read machine only

* When you specify mode 2 or 3, you must specify the following parameters.

When you specify mode 4 or 6, omit the following parameters.

b "Service class" = Valid Range: 001-999 (number)

c "Country code" = Valid Range: 000-999 (number)

d "Postal code"   = Valid Range: 0000-999999

* For mode 2, specify the maximum digit to 9 (number only) and for mode 3, the digit is fixed to 6 (Only capital letters when alpha-numerics are used).

[Data]   ESC+DNmmmm, n-n

m "Data number"Valid Range: 0001-138 (maximum)

n "Print data"

* 00h cannot be specified for the print data.

* For this 2D code, the printed 2D code size stays the same even if the print data number varies.

Mode	Service Class	Country Code	Postal Code	Maximum Number of Print Data	
				Only number	Combination of alphanumerics
2	3 digit fixed (only numeric)	3 digit fixed (only numeric)	9 digit maximum	123	84
3			6 digit fixed (alphanumerics)		
4	Omission			138	93
6					

These are effective when the next command <V>/<H>/<%> is specified before this command.

* If the above mentioned parameters are not specified or the print data is not matched, printing may not be executed.

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ESC+BV   2D Code MAXI Code (RISC Compatible)

[Function]

Specifies the 2D Code MAXI Code.

[Supplement]

01.Rotate print of 90, 180, 270 degrees is made to the counter-clockwise direction around the base reference point.

Example of the 2D Code MAXI Code

<A>

<V>100<H>200

<BV>1,1,2,123456789,001,002,SAHTHA

<Z>

[Parameter] ESC+BVa, b, c, ddddddddd, eee, fff, n-n

a   "Symbol number" = Valid Range: 1-8

b   "Number of symbols" = Valid Range: 1-8

      * It is necessary to specify this parameter when split print is done. Usually specify a = b = 1.

c   "Mode" = 2: For transfer only

                      = 3: For transfer only

                      = 4: Standard symbol

                      = 6: For read machine only

d   "Postal code" = Valid Range: 0000-999999

      * For mode 2, specify the maximum digit to 9 (number only) and for mode 3, the digit is fixed to 6 (Only capital letters when alphanumerics are used).

e   "Country code" = Valid Range: 000-999 (number)

f   "Service class" = Valid Range: 001-999 (number)

n   "Low priority message" = Valid Range: Alphanumerics, Symbols

      * 00h cannot be specified in the print data.

Mode	Service Class	Country Code	Postal Code	Maximum Number of Print Data	
				Only number	Combination of alphanumerics
2	3 digit fixed (only numeric)	3 digit fixed (only numeric)	9 digit maximum	123	84
3			6 digit fixed (alphanumerics)		
4	Omission			138	93
6					

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ESC+2D30   2D Code QR Code (Model 2)

[Function]

Specifies the 2D Code QR Code (Model 2).

Example of the 2D Code QR Code (Model 2) Specification Command

```
<A>
<V>100<H>200<2D30>, L, 05, 0, 0
<DS>1, 012345
<Q>2
<Z>
```

[Parameter]   ESC+2D30, a, bb, c, d (, ee, ff, gg)

a   "Error correction level (error correction)"

L:	7%
M:	15%
Q:	25%
H:	30%

b   "Cell edge size specification (dot number)"

Valid Range: 01-32

c   "Data Setting Mode" 0: Manual

1: Automatic

*The print specification varies according to this setting.

d   "Concatenation Mode"   0: Regular Mode

1: Concatenation Mode

The following parameters must be specified when the Concatenation Mode is specified.
For the Regular Mode, the following parameters must be omitted.

e   "Split Number of Concatenation Mode" Valid Range: 01-16

*A split number is a specification on how many split 2D codes (QR code) are concatenated using the Concatenation Mode.

f   "Sequential Number split with the Concatenation Mode"

Valid Range: 01-16

*The sequential number is the order of the split 2D code (QR code).

g   "Concatenation Mode Parity Data" Valid Range: 00-FF

*The parity data is the data specified by the hex character which is calculated from all print data of the split 2D code (QR code) by XOR.

[Data]   ESC+DSk, n-n

             ESC+DNmmmm, n-n

k   "Input Mode"   1: Numeric Mode

                      2: Alphanumeric Mode

                      3: Kanji Mode (Shift-JIS)

* This setting must be specified when you select the Manual Mode for the Data Setting Mode.

* The Binary setting can also be used for the above, however, you need to use a different data specification command.

m   "Data Number" Valid Range: 0001-2953 (maximum)

n   "Print Data"

* For the data part, the data specification command varies according to the parameter settings or contents of the data.

Automatic Setting (Data Setting Mode)

             ESC+DNmmmm, n-n

* When Kanji is selected, you should specify the size that is two times larger than the Kanji character number.

* When you specify 80h-9Fh, E0h-FFh, the Kanji Mode applies so it cannot be used as binary data.

Binary Specification of Manual Setting (Data Setting Mode)

             ESC+DNmmmm, n-n

Other than Binary Specification of Manual Setting (Data Setting Mode)

             ESC+DS1, n-n(Input Mode: Numeric)

             ESC+DS2, n-n(Input Mode: Alphanumeric)

ESC+DS3, n-n(Input Mode: Kanji)

Mixed Specification of Manual Setting (Data Setting Mode)

For Manual setting, the data of the Input mode (numeric, alpha-numeric, Kanji, binary) can be specified continuously.

Example:

ESC+A

ESC+V100

ESC+H100

ESC+2D30, a, bb, c, d-

ESC+DS3, n-n

ESC+DNmmmm, n-n

ESC+DS1, n-n

ESC+Q1

ESC+Z

* The data must be specified after the parameters. In addition, the data should be specified continuously. If you specify it separately, printing may not be executed correctly.

* Specify the total data (n) to less than 7,000 bytes with this setting. In addition, when you specify the settings continuously, the data block number should be less than 200.

QR Data Size List (For model 2)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary	Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1	L	41	25	10	17	11	L	772	468	198	321
	M	34	20	8	14		M	604	366	155	251
21X21	Q	27	16	7	11	61X61	Q	427	259	109	177
	H	17	10	4	7		H	331	200	85	137
2	L	77	47	20	32	12	L	883	535	226	367
	M	63	38	16	26		M	691	419	177	287
25X25	Q	48	29	12	20	65X65	Q	489	296	125	203
	H	34	20	8	14		H	374	227	96	155
3	L	127	77	32	53	13	L	1022	619	262	425
	M	101	61	26	42		M	796	483	204	331
29X29	Q	77	47	20	32	69X69	Q	580	352	149	241
	H	58	35	15	24		H	427	259	109	177
4	L	187	114	48	78	14	L	1101	667	282	458
	M	149	90	38	62		M	871	528	223	362
33X33	Q	111	67	28	46	73X73	Q	621	376	159	258
	H	82	50	21	34		H	468	283	120	194
5	L	255	154	65	106	15	L	1250	758	320	520
	M	202	122	52	84		M	991	600	254	412
37X37	Q	144	87	37	60	77X77	Q	703	426	180	292
	H	106	64	27	44		H	530	321	136	220
6	L	322	195	82	134	16	L	1408	854	361	586
	M	255	154	65	106		M	1082	656	277	450
41X41	Q	178	108	45	74	81X81	Q	775	470	198	322
	H	139	84	36	58		H	602	365	154	250
7	L	370	224	95	154	17	L	1548	938	397	644
	M	293	178	75	122		M	1212	734	310	504
45X45	Q	207	125	53	86	85X85	Q	876	531	224	364
	H	154	93	39	64		H	674	408	173	280
8	L	461	279	118	192	18	L	1725	1046	442	718
	M	365	221	93	152		M	1346	816	345	560
49X49	Q	259	157	66	108	89X89	Q	948	574	243	394
	H	202	122	52	84		H	746	452	191	310
9	L	552	335	141	230	19	L	1903	1153	488	792
	M	432	262	111	180		M	1500	909	384	624
53X53	Q	312	189	80	130	93X93	Q	1063	644	272	442
	H	235	143	60	98		H	813	493	208	338
10	L	652	395	167	271	20	L	2061	1249	528	858
	M	513	311	131	213		M	1600	970	410	666
57X57	Q	364	221	93	151	97X97	Q	1159	702	297	482
	H	288	174	74	119		H	919	557	235	382

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Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary	Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
21	L	2232	1352	572	929	31	L	4417	2677	1132	1840
	M	1708	1035	438	711		M	3486	2113	894	1452
101X101	Q	1224	742	314	509	141X141	Q	2473	1499	634	1030
	H	969	587	248	403		H	1897	1150	486	790
22	L	2409	1460	618	1003	32	L	4686	2840	1201	1952
	M	1872	1134	480	779		M	3693	2238	947	1538
105X105	Q	1358	823	348	565	145X145	Q	2670	1618	684	1112
	H	1056	640	270	439		H	2022	1226	518	842
23	L	2620	1588	672	1091	33	L	4965	3009	1273	2068
	M	2059	1248	528	857		M	3909	2369	1002	1628
109X109	Q	1468	890	376	611	149X149	Q	2805	1700	719	1168
	H	1108	672	284	461		H	2157	1307	553	898
24	L	2812	1704	721	1171	34	L	5253	3183	1347	2188
	M	2188	1326	561	911		M	4134	2506	1060	1722
113X113	Q	1588	963	407	661	153X153	Q	2949	1787	756	1228
	H	1228	744	315	511		H	2301	1394	590	958
25	L	3057	1853	784	1273	35	L	5529	3351	1417	2303
	M	2395	1451	614	997		M	4343	2632	1113	1809
117X117	Q	1718	1041	440	715	157X157	Q	3081	1867	790	1283
	H	1286	779	330	535		H	2361	1431	605	983
26	L	3283	1990	842	1367	36	L	5836	3537	1496	2431
	M	2544	1542	652	1059		M	4588	2780	1176	1911
121X121	Q	1804	1094	462	751	161X161	Q	3244	1966	832	1351
	H	1425	864	365	593		H	2524	1530	647	1051
27	L	3517	2132	902	1465	37	L	6153	3729	1577	2563
	M	2701	1637	692	1125		M	4775	2894	1224	1989
125X125	Q	1933	1172	496	805	165X165	Q	3417	2071	876	1423
	H	1501	910	385	625		H	2625	1591	673	1093
28	L	3669	2223	940	1528	38	L	6479	3927	1661	2699
	M	2857	1732	732	1190		M	5039	3054	1292	2099
129X129	Q	2085	1263	534	868	169X169	Q	3599	2181	923	1499
	H	1581	958	405	658		H	2735	1658	701	1139
29	L	3909	2369	1002	1628	39	L	6743	4087	1729	2809
	M	3035	1839	778	1264		M	5313	3220	1362	2213
133X133	Q	2181	1322	559	908	173X173	Q	3791	2298	972	1579
	H	1677	1016	430	698		H	2927	1774	750	1219
30	L	4158	2520	1066	1732	40	L	7089	4296	1817	2953
	M	3289	1994	843	1370		M	5596	3391	1435	2331
137X137	Q	2358	1429	604	982	177X177	Q	3993	2420	1024	1663
	H	1782	1080	457	742		H	3057	1852	784	1273

ESC+2D31   2D Code QR Code (Model 1)

[Function]

Specifies the 2D Code QR Code (Model 1).

Example of the 2D Code QR Code (Model 1)

<A>

<V>100<H>200<2D31>, L, 05, 0, 0

<DS>1, 012345

<Q>2

<Z>

[Parameter] ESC+2D31, a, bb, c, d (, ee, ff, gg)

a   "Error correction level"

> L: 7%
>
> M: 15%
>
> Q: 25%
>
> H: 30%

b   "Cell edge size specification (dot number)"

> Valid Range: 01-32

c   "Data Setting Mode"   0: Manual

> 1: Automatic

   * The print specification varies according to this setting.

d   "Concatenation Mode"0: Regular Mode

> 1: Concatenation Mode

The following parameters must be specified when the Concatenation Mode is specified.

e   "Split Number of Concatenation Mode"

> Valid Range: 01-16

   *A split number is a specification on how many 2D codes (QR code) are concatenated using the Concatenation Mode.

f   "Sequential Number split with the Concatenation Mode"

> Valid Range: 01-16

        *The sequential number is the order of the split 2D code (QR code).

g   "Concatenation Mode Parity Data" Valid Range: 00-FF

        *The parity data is the data specified by the hex character which is calculated from all print data of the split 2D code (QR code) by XOR.

[Data]   ESC+DSk, n-n

              ESC+DNmmmm, n-n

k   "Input Mode"   1: Numeric Mode

                        2: Alphanumeric Mode

                        3: Kanji Mode (Shift-JIS)

        * This setting must be specified when you select the Manual Mode for the Data Setting Mode.

        * The Binary setting can be used for the above, however, you need to use a different data specification command.

m   "Data Number" Valid Range: 0001-486

n   "Print Data"

* If the above mentioned parameters are not specified or the print data is not matched, printing may not be executed.

* For the data part, the data specification command varies according to the parameter settings or contents of the data.

Automatic Setting (Data Setting Mode)ESC+DNmmmm, n-n

* When Kanji is selected, you should specify the size that twice as larger than the Kanji character number.

* When you specify 80h-9Fh, E0h-FFh, the Kanji Mode applies so it cannot be used as binary data.

Binary Specification of Manual Setting (Data Setting Mode)

        ESC+DNm, n

Other than Binary Specification of Manual Setting (Data Setting Mode)

          ESC+DS1, n-n(Input Mode: Numeric)

          ESC+DS2, n-n(Input Mode: Alphanumeric)

          ESC+DS3, n-n(Input Mode: Kanji)

Mixed Specification of Manual Setting (Data Setting Mode)

For Manual setting, the data of the Input mode (numeric, alpha-numeric, Kanji, binary) can be specified continuously.

Example:

ESC+A

ESC+V100

ESC+H100

ESC+2D31, a, bb, c, d-

ESC+DS3, n-n

ESC+DNmmmm, n-n

ESC+DS1, n-n

ESC+Q1

ESC+Z

* The data must be specified after the parameters. In addition, the data should be specified continuously. If you specify them separately, printing may not be executed correctly.

QR Data Size List (For model 1)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary	Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1	L	40	24	10	17	11	L	800	485	205	333
	M	33	20	8	14		M	608	368	156	253
21X21	Q	25	15	6	11	61X61	Q	493	299	126	205
	H	16	10	4	7		H	342	207	87	142
2	L	81	49	20	34	12	L	915	555	234	381
	M	66	40	17	28		M	694	421	178	289
25X25	Q	52	31	13	22	65X65	Q	579	351	148	241
	H	33	20	8	14		H	390	236	100	162
3	L	131	79	33	55	13	L	1030	624	264	429
	M	100	60	25	42		M	790	479	202	329
29X29	Q	81	49	20	34	69X69	Q	656	398	168	273
	H	52	31	13	22		H	454	275	116	189
4	L	186	113	48	78	14	L	1167	707	299	486
	M	138	84	35	58		M	877	531	225	365
33X33	Q	114	69	29	48	73X73	Q	738	447	189	307
	H	76	46	19	32		H	48	302	127	207
5	L	253	154	65	106
	M	191	116	49	80
37X37	Q	157	95	40	66
	H	105	63	27	44
6	L	321	194	82	134
	M	249	151	64	104
41X41	Q	201	122	51	84
	H	133	81	34	56
7	L	402	244	103	168
	M	311	188	80	130
45X45	Q	253	154	65	106
	H	167	101	43	70
8	L	493	299	126	206
	M	378	229	97	158
49X49	Q	301	183	77	126
	H	203	123	52	85
9	L	585	354	150	244
	M	441	267	113	184
53X53	Q	369	223	94	154
	H	239	145	61	100
10	L	690	418	177	287
	M	526	319	135	219
57X57	Q	433	262	111	180
	H	291	176	74	121

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ESC+2D32   2D Code QR Code (Micro QR)

[Function]

Specifies the 2D Code QR Code (Micro QR).

Example of the 2D Code QR Code (Micro QR)

<A>

<V>100<H>200<2D32>, L, 04

<DS>1, 012345

<Q>2

<Z>

[Parameter]   ESC+2D32, a, bb

a   "Error correction level"

L:	7%
M:	15%
Q:	25%

b   "Cell edge size specification (dot number)"

Valid Range: 01-32

[Data]   ESC+DSk, n-n

ESC+DNmmmm, n-n

k   "Input Mode"   1: Numeric Mode

2: Alphanumeric Mode

3: Kanji Mode (Shift-JIS)

* The binary setting can be used for the above setting, however, you need to use a different data specification command.

m   "Data Number"Valid Range: 001-15

* This setting is used when you set the binary specification.

n   "Print Data"

µQR Data Size List

Version	Error Correction	Numeric	Alphanumeric	Kanji	Binary
M1 (11X11)	L (Only Error Correction)	5	-	-	-
M2 (13X13)	L	10	6	-	-
	M	8	5	-	-
M3 (15X15)	L	23	14	6	9
	M	18	11	4	7
M4 (17X17)	L	35	21	9	15
	M	30	18	8	13
	Q	21	13	5	9

* For the data part, the data specification command varies according to the parameter settings or information of the data.

Binary SpecificationESC+DNmmmm, n-n

Other than Binary Specification

ESC+DS1, n-n(Input Mode: Numeric)

ESC+DS2, n-n(Input Mode: Alphanumeric)

ESC+DS3, n-n(Input Mode: Kanji)

Mixed Specification

* For Manual setting, the data of the Input mode (numeric, alpha-numeric, Kanji, binary) can be specified continuously.

Example:

ESC+A

ESC+V100

ESC+H100

ESC+2D32, a, b

ESC+DS3, n

ESC+DNmmmm, n-n

ESC+DS1, n-n

ESC+Q1

ESC+Z

* The data must be specified after the parameters. In addition, the data should be specified continuously. If you specify them separately, printing may not be executed correctly.

ESC+BQ   2D QR Code (RISC Compatible)

[Function]

Specifies the 2D Code QR Code.

Example of the 2D Code QR Code Specification Command

<A>

<AX>

<V>100<H>200<BQ>3010,112345

<Z>

[Parameter] "Manual Setting" ESC+BQabcc,(ddeeff,)g(hhhh)

               "Automatic Setting" ESC+BQabcc,(ddeeff,)n

a   "Error correction level (error correction)"

          1: 7%

          2: 15%

          3: 30%

          4: 25%

b   "Concatenation Mode   "0: Regular Mode

                                        1: Concatenation Mode

c   "Cell edge size specification Valid Range: 01-32

      ex) cc = 04

    4 dot
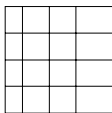
                    4 dot   Feed direction

d   "Split Number of Concatenation Mode"
      Valid Range: 01-16

      * A split number is a specification on how many split 2D
      codes (QR code) are concatenated using the Concatena-
      tion Mode.

e   "Sequential Number split with the Concatenation Mode"
      Valid Range: 01-16

        * The sequential number is the order of the split 2D code (QR code).

f   "Concatenation Mode Parity Data"Valid Range: 00-FF

        * The parity data is the data specified by the hex character which is calculated from all print data of the split 2D code (QR code) by XOR.

g   "Character Mode"

        1: Numeric Mode

        2: Alphanumeric Mode

        3: Binary Mode

        4: Kanji Mode

h   "Data Number" Valid Range: 0001-7366

        * The parameter of hhhh for "Data Number" does not need to be specified if g = 1, 2, or 4.

n   "Print Data"

ESC+2D40   2D Code Very Code

[Function]

Specifies the 2D Code Very Code.

Example of the 2D Code Very Code

<A>

<V>100<H>200<2D40>, 2, 06, 06, 30

<DN>0010, 0123456789

<Z>

[Parameter]   ESC+2D40, a, bb, cc (, dd)

a   "Error correction level"

	L:	7%
	M:	15%
	Q:	25%

b   "Horizontal cell size (dot number)" Valid Range: 01-10

c   "Vertical cell size (dot number)" Valid Range: 01-10

    * b and c should be the same value.

[Data]   ESC+DNmmmm, n-n

m   "Data Number" Valid Range: 0001-196

n   "Print Data"

* If the above mentioned parameters are not specified or the print data is not matched, printing may not be executed.

Matrix size	Input Data Number	
	a=2	a=4
10X10	4	2
12X12	6	2
14X14	10	6
16X16	16	10
18X18	22	14
20X20	28	18
22X22	34	22
24X24	42	26
26X26	52	34
28X28	60	38
30X30	70	46
32X32	82	54
34X34	94	62
36X36	106	70
38X38	118	78
40X40	132	86
42X42	148	98
44X44	162	106
46X46	178	118
48X48	196	130

ESC+VC   2D Code Very Code (RISC Compatible)

[Function]

Specifies the 2D Code Veri Code.

Example of the 2D Code Veri Code

<A>

<AR>

<V>100<H>200

<VC>2220303

<DC>123456789ABCDEFGHIJ

<Z>

[Parameter] ESC+VCaabccdd

a   "Label Matrix Size" Valid Range: 10-48

b   "Error correction level (error correction)"
       Valid Range: 0, 2, 4

* Other values than above are regarded as "0".

Relationship between Error correction leven and User data ratio / Error correction ability

Error correction level	User data ratio	Error correction ability ratio
2	75%	Max 12.5%
4	50%	Max 25.0%

$$\text{User data ratio} = \frac{\text{User data cell number}}{\text{Total data cell number}} \times 100$$

$$\text{Error correction ability ratio} = \frac{\text{Error correctable data cell number}}{\text{Total data cell number}} \times 100$$

c   "Horizontal cell size (dot number)"
       Valid Range: 01-10 (dot/cell)

       * Other values than above are regarded as "01".

d   "Vertical cell size (dot number)"
       Valid Range: 01-10 (dot/cell)

       * Other values than above are regarded as "01".

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Print position

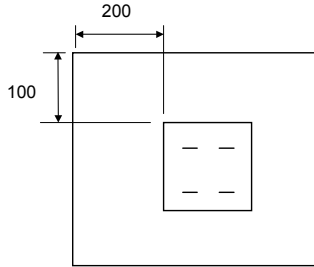The print start position for Veri Code is the top left corner.

Ex) <A>

<V>100<H>200

<VC>**....**

<DC>***....*

<Z>

Relationship between Matrix size and Input data size

Matrix Size	Input Data Size	
	ecc=2	Ecc=4
10X10	4	2
12X12	6	2
14X14	10	6
16X16	16	10
18X18	22	14
20X20	28	18
22X22	34	22
24X24	42	26
26X26	52	34
28X28	60	38
30X30	70	46
32X32	82	54
34X34	94	62
36X36	106	70
38X38	118	78
40X40	132	86
42X42	148	98
44X44	162	106
46X46	178	118
48X48	196	130

* "ecc" means "Error Correction".

< How to refer to the above table>

If "ecc" is set at "2" and data digit number is set at "10" for example, the matrix size needs to be set at "14".

If "ecc" is set at "2" and data digit number is set at "12", the matrix size needs to be set at "16".

ESC+2D50   2D Code Data Matrix Code (ECC200)

[Function]

Specifies the 2D Code ECC200.

[Parameter]

01.   If the following parameters are not specified or print data is not matched, printing may not be executed.

02.   When you specify the print format, keep more than 2 mm space for each edge of the data matrix code as a scanning margin.

Example of the 2D Code Data Matrix Code (ECC200)

<A>

<V>100<H>200<2D50>, 03, 03, 000, 000

<DN>0010, 0123456789

<Z>

[Parameter]   ESC+2D50, a, bb, ccc, ddd

a   "Horizontal cell size" 01-16

b   "Vertical cell size" 01-16

c   "Cell number on one line" 000 (Automatic), 009-148

d   "Cell number" 000 (Automatic), 009-148

        * b and c should be the same value.

[Data]   ESC+DNmmmm, n-n

m   "Data Number" Valid Range: 0001-3116

n   "Print Data"

	Numeric	3116
Data type	Alphanumeric	2335
	Binary (01h-FFh)	1556

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ESC+BX   2D Code Data Matrix Code (RISC Compatible)

[Function]

Specifies the 2D Code Data Matrix Code.

Example of the 2D Code Data Matrix Code

<A>

<V>100<H>200<BX>01100202000000001

<DC>1234567890

<Q>2
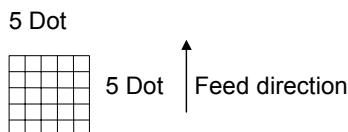
<Z>

[Parameter] ESC+BXaabbcccddeeefffghh

a   "Format ID"   Valid Range:01-16

b   "Error correction level (error correction)"

          00: ECC000

          05: ECC050

          08: ECC080

          10: ECC100

          14: ECC140

          20: ECC200

    *If "20 (ECC200)" is specified, "Format ID", "Mirror Image" and "Thickness of Guide Cell" are ignored.

c   "Cell width size" Valid Range:01-16 (dot/cell)

d   "Cell pitch size" Valid Range:01-16 (dot/cell)

    *01 and 02 can be specified for "cc" and "dd" but may not be read.

    ex) cc = 05, dd = 05

5 Dot

5 Dot | Feed direction

e   "Cell number on one line"
        Valid Range: 000 (Automatic), 008-148

f   "Cell line number" Valid Range: 000 (Automatic), 008-148

        * If eee=fff=000, the matrix size is automatically set
        according to the specified data number.

g   "Mirror image" = 0 : Normal image (Normal printing)

                        = 1 : Mirror image

h   "Guide cell thickness" Valid Range: 01 (Normal type) - 15

Mirror image: The image of inversed normal image with cross
point of guide cells as the cardinal point.

Normal image   Mirror image

Format ID Table

Error correction	Format ID					
(error correction)	01	02	03	04	05	06
00 (ECC000)	500	452	394	413	310	271
05 (ECC050)	457	333	291	305	228	200
08 (ECC080)	402	293	256	268	201	176
10 (ECC100)	300	218	190	200	150	131
14 (ECC140)	144	105	91	96	72	63

	Numeric	3116
20 (ECC200)	Alphanumeric	2335
	Binary (01h - FFh)	1556

ESC+BX   2D Code Data Matrix Code Data (RISC Compatible)

[Function]

Specifies the 2D Code Data Matrix Code Data.

[Supplement]

01.Number and contents of data varies according to the specifications of format ID or ECC level.

Example of the 2D Code Data Matrix Code Data Specification Command

\<A>

\<V>100\<H>200\<BX>01100202000000001

\<DC>1234567890

\<Q>2

\<Z>

[Parameter] ESC+DCn-n

n   "Print data"

ESC+BX   2D Code Data Matrix Code Sequential Numbering (RISC Compatible)

[Function]

Specifies the 2D Code Data Matrix Code Seqneutial Numbering.

[Supplement]

01.Place the sequential numbering command before numeric data.

02.Sequential numbering can be specified up to 8 places.

Example of the 2D Code Data Matrix Code Sequential Numbering Command

<A>

<V>100<H>200

<FX>001+001005003

<BX>01100202000000001

<DC>00006000

<Q>2

<Z>

[Parameter] ESC+FXaaabcccdddeee

- a   "Print Number Specification of the identical information"
  = 001-999

- b   "Increase/Decrease Specification" =
  + : Addition

  - : Reduction

- c   "Setting Increase/Decrease value" = 001-999

- d   "Digit position specification" = 001-999

- e   "Digit number" = 001-999

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6.   2D Code Table

6.1   PDF417 Code Table

							S		I						S		O			
				b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P		p			SP	─	夕	ミ		
0	0	0	1	**1**			!	1	A	Q	a	q			。	ア	チ	ム		
0	0	1	0	**2**	STX		"	2	B	R	b	r			「	イ	ツ	メ		
0	0	1	1	**3**	ETX		#	3	C	S	c	s			」	ウ	テ	モ		
0	1	0	0	**4**			$	4	D	T	d	t			、	エ	ト	ヤ		
0	1	0	1	**5**			%	5	E	U	e	u			・	オ	ナ	ユ		
0	1	1	0	**6**			&	6	F	V	f	v			ヲ	カ	ニ	ヨ		
0	1	1	1	**7**			'	7	G	W	g	w			ア	キ	ヌ	ラ		
1	0	0	0	**8**			(	8	H	X	h	x			イ	ク	ネ	リ		
1	0	0	1	**9**			)	9	I	Y	i	y			ウ	ケ	ノ	ル		
1	0	1	0	**A**			*	:	J	Z	j	z			エ	コ	ハ	レ		
1	0	1	1	**B**		ESC	+	;	K	[	k	{			オ	サ	ヒ	ロ		
1	1	0	0	**C**			,	<	L	¥	l	|			ヤ	シ	フ	ワ		
1	1	0	1	**D**			-	=	M	]	m	}			ユ	ス	ヘ	ン		
1	1	1	0	**E**			.	>	N	^	n				ヨ	セ	ホ	゛		
1	1	1	1	**F**			/	?	O	_	o				ッ	ソ	マ	゜		

6.2   MAXI Code Table

B4	b3	b2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
B8					0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
B7					0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
B6					0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
B5					0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
0	0	0	0	0			SP	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2			"	2	B	R	b	r								
0	0	1	1	3			#	3	C	S	c	s								
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5			%	5	E	U	e	u								
0	1	1	0	6			&	6	F	V	f	v								
0	1	1	1	7			'	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	×								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	¥	l	|								
1	1	0	1	D			−	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o	DEL								

6.3　Very Code Table

			S		I			S		O	
b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

b4	b3	b2	b1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P		p			SP	–	タ	ミ		
0	0	0	1	1			!	1	A	Q	a	q			。	ア	チ	ム		
0	0	1	0	2	STX		"	2	B	R	b	r			「	イ	ツ	メ		
0	0	1	1	3	ETX		#	3	C	S	c	s			」	ウ	テ	モ		
0	1	0	0	4			$	4	D	T	d	t			、	エ	ト	ヤ		
0	1	0	1	5			%	5	E	U	e	u			・	オ	ナ	ユ		
0	1	1	0	6			&	6	F	V	f	v			ヲ	カ	ニ	ヨ		
0	1	1	1	7			'	7	G	W	g	w			ァ	キ	ヌ	ラ		
1	0	0	0	8			(	8	H	X	h	x			ィ	ク	ネ	リ		
1	0	0	1	9			)	9	I	Y	i	y			ゥ	ケ	ノ	ル		
1	0	1	0	A			*	:	J	Z	j	z			ェ	コ	ハ	レ		
1	0	1	1	B		ESC	+	;	K	[	k	{			ォ	サ	ヒ	ロ		
1	1	0	0	C			,	<	L	¥	l					ャ	シ	フ	ワ		
1	1	0	1	D			-	=	M	]	m	}			ュ	ス	ヘ	ン		
1	1	1	0	E			.	>	N	^	n				ョ	セ	ホ	゛		
1	1	1	1	F			/	?	O	_	o				ッ	ソ	マ	゜		

6.4   ECC200 Code Table

B8	b3	b2	b1				S		I					S				O		
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			"	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			'	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	¥	l	|								
1	1	0	1	**D**			−	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[Supplement]

01. 00h cannot be used in the print data.

6.5   QR Code (Numeric Mode) Table

b4	b3	b2	b1		S I (b8=0)								S O (b8=1)							
				b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

6.6   QR Code (Alphanumeric Mode) Table

						S	I					S		O						
				b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0		P										
0	0	0	1	1				1	A	Q										
0	0	1	0	2				2	B	R										
0	0	1	1	3				3	C	S										
0	1	0	0	4			$	4	D	T										
0	1	0	1	5			%	5	E	U										
0	1	1	0	6				6	F	V										
0	1	1	1	7				7	G	W										
1	0	0	0	8				8	H	X										
1	0	0	1	9				9	I	Y										
1	0	1	0	A			*	:	J	Z										
1	0	1	1	B			+		K											
1	1	0	0	C					L											
1	1	0	1	D			-		M											
1	1	1	0	E			.		N											
1	1	1	1	F			/		O											

6.7   QR Code (Binary Mode) Table

b4	b3	b2	b1		0	1	2 (S)	3	4 (I)	5	6	7	8	9	A (S)	B	C (O)	D	E	F
				b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
0	0	0	0	0			SP	0	@	P	`	p				‐	タ	ミ		
0	0	0	1	1			!	1	A	Q	a	q			。	ア	チ	ム		
0	0	1	0	2			"	2	B	R	b	r			「	イ	ツ	メ		
0	0	1	1	3			#	3	C	S	c	s			」	ウ	テ	モ		
0	1	0	0	4			$	4	D	T	d	t			、	エ	ト	ヤ		
0	1	0	1	5			%	5	E	U	e	u			・	オ	ナ	ユ		
0	1	1	0	6			&	6	F	V	f	v			ヲ	カ	ニ	ヨ		
0	1	1	1	7			'	7	G	W	g	w			ア	キ	ヌ	ラ		
1	0	0	0	8			(	8	H	X	h	x			イ	ク	ネ	リ		
1	0	0	1	9			)	9	I	Y	i	y			ウ	ケ	ノ	ル		
1	0	1	0	A			*	:	J	Z	j	z			エ	コ	ハ	レ		
1	0	1	1	B			+	;	K	[	k	{			オ	サ	ヒ	ロ		
1	1	0	0	C			,	<	L	¥	l	|			ヤ	シ	フ	ワ		
1	1	0	1	D			-	=	M	]	m	}			ユ	ス	ヘ	ン		
1	1	1	0	E			.	>	N	^	n	‾			ヨ	セ	ホ	゛		
1	1	1	1	F			/	?	O	_	o	DEL			ツ	ソ	マ	゜		

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7. Option Command (Memory Card)

ESC+CC   Card Slot Specification

[Function]

Specifies the card slot number.

[Supplement]

01.   When you use a command for the memory card, you must specify the card slot number.

02.   An error occurs when no card is inserted or if you specify the slot where a card is not inserted.

Example of the Card Slot Specification Command

<A>

<CC>1

<GI>*-*

<Z>

[Parameter]   <CC>a

You can confirm the card slot specification by setting the "Advanced Mode", "Card Mode".

When "MEM SELECT (CC1)" is set to "CARD",

a   "Slot number" 1: Slot

                                2: Flash ROM

When "MEM SELECT (CC1)" is set to "MEMORY",

a   "Slot number" 1: Flash ROM

                                2: Slot

ESC+BJF Memory Card Format Specification

[Function]

Specifies the memory card format (initialization).

[Supplement]

01.   Since this command is used to format the memory card, you cannot use it with other commands.

02.   If the card is write-protected, an error occurs and format-ting is cancelled.
Be careful when formatting a card, as SATO does not take any responsibility for any loss of data in case of mistakenly formatting a card.

Example of the Memory Card Format Command

<A>

<CC>1

<BJF>SATO

<Z>

[Parameter]   <BJF>aaaaaaaa

a   "user ID" (8 bytes)

Specify the user ID using alphanumerics and symbols.

ESC+BJS Print Status of the Memory Card

[Function]

Specifies the print status of a memory card.

[Supplement]

01.   You cannot use this command with other commands.

Example of the Print Status of the Memory Card Command

<A>

<CC>1

<BJS>

<Z>

Contents of the Print Status of the Memory Card:

Memory Card size

ID Number

Number of Format Registrations

Number of Graphics Registrations

Number of PCX File Registrations

Number of True Type Font Registrations

Area Available for using Memory Card

Printing Area (Length Direction) when using Card

Battery Check

ESC+EX Print Area Extension

[Function]

Specifies the print area extension (vertical direction).

[Supplement]

01. When you turn off the printer, it returns to the default setting (AR).

02. Images outside the drawing area are cut.

03. Use the <%> command when you apply the rotation function.

Example of the Extended Memory Specification Command

<A>

<EX>0

<Z>

[Parameter] <EX>a

a "Slot Number Specification" 0: Internal Memory (no Extended Memory required)

Model	Standard (AR)	Print Area Extension (EX)
CL408e CL608e M8400RVe M8485Se M8460Se M8459se	1424dot (178mm)	9999dot (1249mm)
CL412e M8490Se CL612e	1236dot (178mm)	9999dot (833mm)

The data in the parentheses ( ) is rounded after the decimal point and calculated into (mm).

ESC+YS   Format Storage

[Function]

Registers the print form memory.

[Supplement]

01.   A memory card is required to use this command. If you do not have a memory card, you cannot use this command.

02.   When you use more than one command, differentiate one format with <A>-<Z>.

03.   The following are format registration commands that are not available.

    <Q>   <&>   <C>   <@>   <*>

    <#E>   <CS>   <T1>   <T2>   <0>

    <BT>   <GI>   <NUL>   <PI>   </D>

    <BJS> <BJF> <G>   <GP>   <GT>

    <ID>   <EX>   <~>

04.   Use this command with the field registration </N>.

05.   When an already registered number is again registered, an error occurs. Then, the contents that you try to re-register are printed.

06.   Be sure to specify <CC> before this command.

Example of the Format Registration Command

<A>

<CC>1

<YS>, 01

</N>, 3, 3

<%>0<V>100<H>200<P>2<L>0101<XM>ABC

<Z>

[Parameter]   <YS>, aaa

a   "Format Registration No." = Valid Range: 1-999

ESC+/N   Variable Field Specification

[Function]

Specifies items in the field for format registration.

[Supplement]

01.   Enter <%> from the part you want to rotate, to rotate the contents.

02.   Specify the smaller number in sequential manner for the field number.

03.   Make sure to specify <V> o <H> for each field.

04.   If there is no specification, the default value takes effect.

05.   When a custom-design character is printed, specify the digit as follows.
When Custom-Design Character code "H" is specified, the Custom-Design Character becomes 4-digits and three custom-design character s become 12-digits.
When the Custom-Design Character code "B" is specified, a Custom-Design Character becomes 2-digits and three Custom-Design Characters become 6-digits.

06.   For the registration digit of the fixed field, specify another value other than 00.

07.   The following are the Change Print Specification Commands.

  <XU>o<XS>o<XM>o<XB>o<XL>

  <OA>o<OB>o<$=>o<B>o<D>o<BD>

08.   Use this command with the format registration <YS>.

09.   99 items may not be registered due to the memory capacity.

Example of the Field Registration Command

<A>

<CC>1

<YS>, 01

</N>, 1, 3

<%>0<V>100<H>200<P>2<L>0101<XM>ABC

<Z>

[Parameter]   \</N>, aa, bb

a   "Field No." =Valid Range: 1-99

b   "Print Digit" =Valid Range: 1-99

ESC+YR   Format Recall

[Function]

Calls up and prints the data registered by using the format reg-istration command <YS>.

[Supplement]

01.   This command does not search for more than one format.

02.   This command is used with the field print </D>.

Example of the Format Search Command

<A>

<CC>1

<YR>, 01

</D>, 1, DEF

<Q>2

<Z>

[Parameter]   <ESC+YR>, aaa

a   "Format Registration No." Valid Range: 1-999

ESC+/D   Variable Field Recall

[Function]

Reads the registered items from the Field Item Registration and specifies the data.

[Supplement]

01. The print digit is only effective within the declaration of </N>.

02. If the digit specified with this command is larger than the digit in the declaration of </N>, only the declared digit is effective for printing.

03. This command is used in the field registration <YR>.

Example of Format Search Command

<A>

<CC>1

<YR>, 01

</D>, 1, DEF

<Q>2

<Z>

[Parameter]   </D>, aa, n-n

a   "Field No." = Valid Range: 1-99

n   "Data"

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ESC+GI Graphics Storage

[Function]

Specifies the graphics pattern data registration.

[Supplement]

01. Specify the registered data only.
02. If you change the registration, clear the data by using the Clear command and then re-register it.
03. Data registered with this command is printed with the graphic search command.
04. This command cannot be used without a memory card.
05. If the data is not registered correctly, the data may not be printed. For more information on data format, refer to the Graphic Print Specification <G> command.
06. When an already registered number is again registered, an error occurs. Then, the contents that you try to re-register are printed and the process continues.
07. Be sure to specify <CC> before this command.

Example of the Graphics Registration Specification Command

<A>

<CC>1

<GI>H003003001n-n

<Z>

[Parameter]   <GI>abbbcccdddn-n

a   "Hex or binary data transfer selection"

      H: Hex data (8 bit data is divided into 4 bit and output as a hex code supported by ASCII)

      B: Binary data (8 bit is output as one character data)

b   "Specify the byte unit of the graphic area in the H direction"

c   "Specify the byte unit of the graphic area in the V direction"

d   "Registration Number. This is an ID to search data. Valid Range: 1-999"

n   "Data"

Model	Maximum byte in H direction	Maximum byte in V direction
CL408e	104	178
CL412e	156	267
CL608e	152	178
CL612e	248	267
M-8400RVe	104	178
M-8485Se	128	178
M-8490Se	168	267
M-8460Se	152	178
M-8459Se	112	178

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ESC+GR   Graphic Recall

[Function]

Specifies the print of searched data registered with the graphic registration command.

[Supplement]

01.   This command ignores the Start Point Correction Specification Command <A3> so that no correction takes place.

02.   Rotation and enlargement are possible with this command.

03.   Printing is possible when the print area extension is specified.

04.   This command cannot be used without a memory card.

05.   Make sure to specify <CC> before this command.

Example of the Graphic Search Specification Command

<A>

<CC>1<V>100<H>100

<GR>1

<Q>1

<Z>

[Parameter]   <GR>aaa

a   "Registration Number" = Valid Range: 1-999

ESC+PI   PCX File Storage

[Function]

Specifies the PCX file registration created with Windows drawing applications such as Paint.

Data can be sent as binary data (output 8-bit as one font data).

[Supplement]

01.   The first 128 byte of the data is treated as a header and the following data is compressed.

02.   If the total byte number does not match with the amount of data transferred, the printing will not be successful.

03.   The total byte number is the size that appears by entering the „Dir" command.

04.   A PCX file can only be used in Black/White mode. A PCX file with the color mode is not printed because a command error occurs. In addition, print BMP file cannot be specified with this command. Confirm that the file is ***.PCX and start printing.

05.   If you try to register a number that is already registered, an error occurs.

06.   Be sure to specify <CC> before this command.

Example of the PCX File Registration Specification Command

<A>

<CC>1<V>100<H>100

<PI>001, 12345, n-n

<Z>

[Parameter]   ESC+PIa, bbbbb, n

a   "Registration Number" = Valid Range: 1-999

b   "Total bytes of a PCX file"

          For the total bytes, specify file/size of the PCX file.

n   "Print Data"

ESC+PY PCX File Recall

[Function]

Specifies the search print of the registered data with the PCX File Registration command.

[Supplement]

01.   Rotation and enlargement are possible with this command.

02.   Be sure to specify <CC> before this command.

Example of the PCX File Search Specification Command

<A>

<CC>1<V>100<H>100

<PY>001

<Q>2

<Z>

[Parameter]   <PY>a

a   "Registration Number" = Valid Range: 1-999

ESC+GT   BMP File Storage

[Function]

Specifies the BMP File Print created with Windows drawing applications such as Paint.

Data can be sent as binary data (output 8-bit as one font data).

[Supplement]

01.   In a BMP file, the first 62 byte of the data is treated as a header and the following data is image data.

02.   If the total byte number does not match with the amount of data transferred, printing will not be successful.
The total byte is the file size displayed by entering „Dir" command.

03.   A BMP file can only be used in the Black/White mode. A BMP file with the color mode is not printed because a command error occurs. In addition, print PCX file cannot be specified with this command. Confirm that the file is ***.BMP and start printing.

04.   If you try to register a number that is already registered, an error occurs.

05.   Be sure to specify <CC> before this command.

Example of the BMP File Print Specification Command

<A>

<CC>1<GT>001, 12345, n-n

<Z>

[Parameter]   <GT>aaa, bbbbb, n-n

a   "Registration Number" = Valid Range: 1-999

b   "Total bytes of a BMP file"

n   "Data"

ESC+GC   BMP File Recall

[Function]

Specifies the call up and print of the registered data with the BMP File Registration command.

[Supplement]

01.   Be sure to specify <CC> before this command.

02.   Rotation and enlargement can be applied with this command.

Example of the BMP File Call Up Specification Command

<A>

<CC>1<V>100<H>100

<GC>001

<Q>2

<Z>

[Parameter]   <GC>a

a   "Registration Number" = Valid Range: 1-999

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ESC+BJR True Type Recall

[Function]

Calls up the True Type Font.

[Supplement]

01.   For this command to operate, an option card is necessary.

02.   Before using this command, make sure to specify the registered slot number with command <CC>.

Example on using the True Type Font Call Up Specification command.

<A>

<CC>1

<V>100<H>200<CC>1

<BJR>1020201000004SATO

<Z>

[Parameter]   <BJR> abbccddeeffffn-n

a   "Font ID" = Valid Range: 0-9

b   "Horizontal Magnification" = Valid Range: 01-12

c   "Vertical Magnification" = Valid Range: 01-12

d   "Preparations" = 0 Fixed

e   "Print Character Number" = Valid Range: 0000-9999

n   "Data"

ESC+BJT True Type Font Recall

[Function]

Calls up the True Type Font.

[Supplement]

01.   For this command to operate, an option card is necessary.

02.   Before using this command, make sure to specify the reg-
       istered slot number with command <CC>.

Example on using the True Type Font Call Up Specification com-
mand.

<A>

<CC>1

<V>100<H>200<CC>1

<BJT>10, 02, 02, 10, 00, 0004, SATO

<Z>

[Parameter]   <BJR>aa, bb, cc, dd, eee, fff, n-n

a   "Font ID" = Valid Range: 00-99

b   "Horizontal Magnification" = Valid Range: 01-12

c   "Vertical Magnification" = Valid Range: 01-12

d   "Length between characters" = Valid Range: 01-99

e   "Preparations" = 0 Fixed

f   "Print Character Number" = Valid Range: 0000-9999

n   "Data"

ESC+BJ+ESC+BJD   True Type Storage

[Function]

Registers the True Type Font.

[Supplement]

01.   In order to use this command, an option memory card is necessary.

02.   Before using this command, make sure to specify the registered slot number with <CC>.

Example on using the True Type Font Registration Specification command.

<A>

<CC>1

<BJ> (abcdefghi jkabcdefghi jkabcdefghi jkabcdefghi jkabcdefghi jk29-08-2000

<BJD>00000002203000F002B0012000000010015010000FDFF00000000

<BJ>)

<Z>

[Parameter]   <BJ> (a … ab .. b)

a   "Font Description"   40 byte font specification

b   "Date"   10 byte data

        <BJD>c..cdddde..e

c   "Memory Offset"

d   "Data Byte Number"   Valid Range : 0001-2000

e   "Font Data to be downloaded"

ESC+&S   Form Overlay Registration Specification

[Function]

This command specifies the registration into the memory card of the fixed print content.

[Supplement]

01.   Before using this command, make sure to specify the registered slot number with <CC>.

02.   Make sure to separate the registered format between <A> and <Z>.

03.   This command will specify the last line of printed data to be memorized.

04.   The same registration number will not be saved.

05.   It is possible to register all together with this command BMP, PCX, and graphic data.

06.   If the print area has been extended using command <AX>, it is possible to save the extended area with the above command.

07.   It is possible with this command to save MAX 99 items, however, please be aware that due to the capacity of the memory card, the above number can change.

08.   The data saved with this command, will be cleared with <*>R, a (Registration Number).

09.   There are no limitations to saving with this command, however, there are cases when depending on the type of data specified, saving might not occur correctly.

Please be aware that if you come half-way into the following commands, it is possible that some difficulties might occur.

<A> Send<BT> Barcode Ratio Registration<CC>Card Slot

<Z> Send Complete<BW>Ratio Specification Barcode Print<BJF>Card Format

<C> Copy<&>Form Overlay Registration <BJS>Card Status Print

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<0> Partial Edit<T1>Custom-Design Character Registra-tion<EX>Card Expansion

<A3> Start Point Off-set<T2>Custom-Design Character Registration<~>Multi-cut

<CS> Print Speed<YS>Form Registration<GT>BMP Registration

<#E> Print Density</N>Field Registration<NUL>Multi-cut

<@> Offline<GI>Graphic Registration

<ID> ID Number<PI>PCX Registration

<*> Clear<TE> Bitmap Font Registration

In case the following happens:
(1) Normal Specification (Will register)
<A>

Registration Content

<&S>, 1
<Z>

(2) If there was a printing specification after <&S>
<A>

Registration Content
(Delete
Anything opened before specifying <&S> will be deleted.)

<&S>, 1
<V> *** <H> *** <OB> ***
<Z>

If the window size was specified
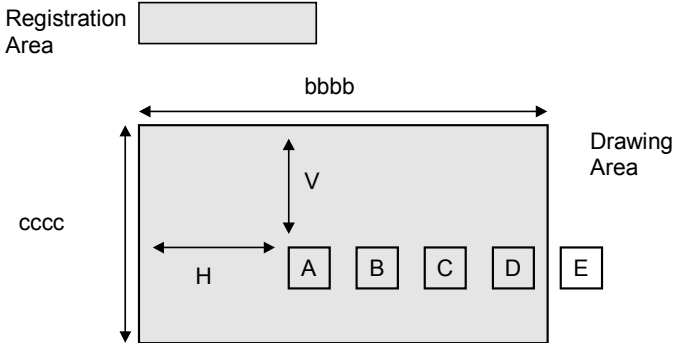
Registration
Area

Example of using the Format Overlay Registration Specification command.

<A>

<CC>1

<V>100<H>100<XB>0 MODEL

<&S>

<Z>

[Parameter]   <&S>, a, b, c

a Registration Number   Valid Range: 1-99

b Window Horizontal Specification Valid Range: 50-H Max

c Window Vertical Specification   Valid Range: 50-V Max

* Normally it is used with the Registration Number, however, depending on the horizontal and vertical specifications of the window, it is possible to move with <V> and <H> when searching. In case the registered area goes over the printing area, during searching, the part which has gone over will not be printed.

ESC+&R   Form Overlay Recall Specification

[Function]

This command recalls up the data saved into the memory as Fixed Print Data.

[Supplement]

01.   Before using this command, make sure to specify the registered slot number with <CC>.

02.   It is possible that this command will combine different registration numbers and print.

03.   In case that the registration number has not been specified, this command will not function.

04.   If a registration number that is not specified is registered, a read-write error will be displayed.

05.   If no window has been specified but registration has taken place, <V> and <H> will be ignored and it will be opened from the top of the drawing area (V1, H1).

06.   If a window has been specified and registered, it will be possible to move by using <V> and <H>. However, please be aware that if you go over the print area, the part that has gone over will not be printed.

Example on using the Form Overlay Call Up Specification command

<A>

<CC>1

<&R>1

<Z>

[Parameter]   <&R>, a
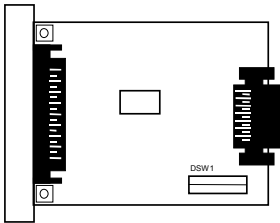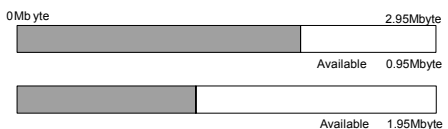
a   Registration Number = Valid Range: 1-99

8. RS232C Interface

8.1 Basic Specifications

The serial interface for this printer complies with the RS-232C specification.

It is possible to set with the Dip Switch the one Item reception and the multi-reception functions that are in the reception mode.

Interface Board	

DSW1					
DSW1 1) Character Structure 2) Transfer Rate 3) Protocol	1-1	Data Bit Length	OFF		8 bit
			ON		7 bit
	1-2 1-3	Parity Bit (2-3)	OFF	OFF	None
			OFF	ON	Even
			ON	OFF	ODD
			ON	ON	Not Used
	1-4	Stop Bit	OFF		1 bit
			ON		2 bit
	1-5 1-6	Baud Rate (5-6)	OFF	OFF	9600 bps
			OFF	ON	19200 bps
			ON	OFF	4800 bps
			ON	ON	2400 bps
	1-7 1-8	Protocol (7-8)	OFF	OFF	Ready/Busy
			OFF	ON	Xon-Xoff
			ON	OFF	Status 3
			ON	ON	Status 2 (DSW2-8 ON), Status 4 (DSW2-8 OFF)

Synchronization Type	Pacing Synchronization Type
Maximum Reception Buffer Capacity	2.95MB
Codes Used	ASCII Character Codes
Connector	Printer Side DB-25S (Equivalent) (Male) Cable Side DB-25P (Equivalent) (Female) Cable Length Less than 5 m
Transfer Format	Start | b1 | b2 | b3 | b4 | b5 | b6 | b7 | b8 | Stop Note: When a 7-bit unit is used, the b8 is omitted.
Signal Level	High Level: +5 to +12V Low Level: −5 to −12V

8.2 Ready/Busy

This protocol controls reception of the print data from the hardware signal control without any software procedures. In addition, one item reception and multiple reception can be switched with the DSW.

The data received is not guaranteed when the print data (STX + ESC+ "A" - ESC+ "Z" + ETX) is sent from the host under the following conditions:

1) When the printer is off-line.

2) When an error occurs with the printer.

8.2.1 Connection

1) DB-25P

Printer				Host
FG	1	————	1	FG
SD	2	———→	3	RD
RD	3	←———	2	SD
RS	4	———→	5	CS
CS	5	←———	4	RS
DR	6	←———	20	ER
SG	7	————	7	SG
ER	20	———→	6	DR

2) DB-9P

Printer				Host
FG	1			
SD	2	———→	2	RD
RD	3	←———	3	SD
RS	4	———→	8	CS
CS	5	←———	7	RS
DR	6	←———	4	ER
SG	7	————	5	SG
ER	20	———→	6	DR

8.2.2 Description of the Input/Output Signal

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
4	RS	Output	A "Low" level results, when an error occurs.
5	CS	Input	Always keep it in "High".
6	DR	Input	Always keep it in "High".
7	SG	-	Signal Ground
20	ER	Output	The output is "High", when the printer accepts data. A "Low" level results, when an error occurs or the printer is off-line.

8.3   X-ON/OFF

This protocol instructs the host whether data can be received or not from the printer by sending the "XON" (hex digit 11H) or "XOFF" (hex digit 13H) code to the SD line.

It can also be switched between the One Item Reception and the Multiple Reception mode by using the DSW.

The receival of data is not guaranteed when the print data (STX + ESC+ "A" - ESC+ "Z" + ETX) is sent from the host under the following conditions:

1) When the printer is off-line.

2) When an error occurs with the printer.

8.3.1 Line Connection
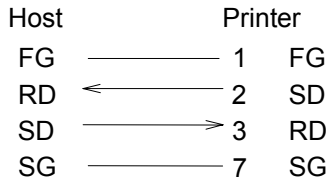
```
     Host              Printer
     FG  ───────────  1   FG
     RD  ◄──────────  2   SD
     SD  ──────────►  3   RD
     SG  ───────────  7   SG
```

Note: Some host types require that the CS and RS loop on the host side (always keep CS and RS "High").

8.3.2 Input and Output Signals

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
7	SG	-	Signal Ground

8.4 Status 3 Return

The objective of this protocol is to control the printer status from the host and return the status from the printer by receiving the request command from the host.

Please note that the status is immediately returned after receiving the request command.

When the protocol is set, the reception mode will be in the multiple reception.

The data received is not guaranteed when the print data (STX + ESC+ "A" - ESC+ "Z" + ETX) is sent from the host under the following conditions:

1) When the printer is off-line.

2) When an error occurs with the printer.

8.4.1 Line Connection
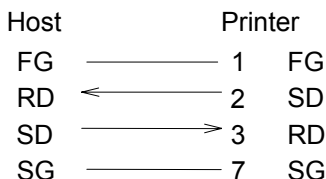
```
         Host              Printer
          FG  ───────── 1   FG
          RD  ◄───────── 2   SD
          SD  ─────────► 3   RD
          SG  ───────── 7   SG
```

Note: **Some host types require that the CS and RS loop on the host side (always keep CS and RS "High").**

8.4.2 Input and Output Signals

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
7	SG	-	Signal Ground

8.4.3 Return Status

For this protocol, the printer condition and response are returned to the host as the status by receiving two types of request command or print command.

The following is a description of each request command and return status.

1) Status Request command

In receiving this command, the ID number of the reception data that is currently being printed, the printer condition, the remaining paper and Job Number are returned to the host. When the printing is completed and if there is no reception data or the ID number command is not specified, the ID number returns a space (hex digit 20H) and the print number returns all "0" (hex digit 30H).

1. CommandENQ (Hex 05H)

2. Return Status Format

> STX (Hex 02H)
>
> ETX (Hex 03H)

STX | ID Number | Status | Available Print Number | ETX | (11 Byte)
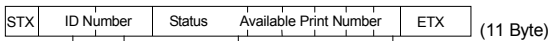
From 000000 to 999999

The ID number is set according to the ID number command specified by ESC+ "A" - ESC+ "Z".
If there are more than one reception data, the ID number of the reception data that is currently being printed returned.

3. Status List

Description			ASCII	Hex
Off-line condition	Non Error		0	30
	Ribbon Near End		1	31
	Buffer Near Full		2	32
	Ribbon Near End and Buffer Near Full		3	33
On-line condition	Wait for reception	Non Error	A	41
		Ribbon Near End	B	42
		Buffer Near Full	C	43
		Ribbon Near End and Buffer Near Full	D	44
	Printing	Non Error	G	47
		Ribbon Near End	H	48
		Buffer Near Full	I	49
		Ribbon Near End and Buffer Near Full	J	4A
	Wait for dispenser	Non Error	M	4D
		Ribbon Near End	N	4E
		Buffer Near Full	O	4F
		Ribbon Near End and Buffer Near Full	P	50
	Analyze/Edit	Non Error	S	53
		Ribbon Near End	T	54
		Buffer Near Full	U	55
		Ribbon Near End and Buffer Near Full	V	56
Error detection (Off-line condition)	Reception Buffer Full		a	61
	Printer Head Open		b	62
	Paper End		c	63
	Ribbon End		d	64
	Media Error		e	65
	Sensor Error		f	66
	Printer Head Error		g	67
	Cover Open		h	68
	Card Error		i	69
	Cutter Error		j	6A
	Other Errors		k	6B

The print number may not be set according to the edit/analyze timing.

2) Cancel Request Command

Once this command has been received, printing is terminated and all data in the reception buffer is deleted.

The status returned informs that the above procedure has been completed.

1. Command CAN (Hex 18H)

2. Return Status Format

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

3) Print command

Once the print command has been received printing status. (ESC+"A" - ESC+"Z")

The status inform that the printer has completed the reception process.

1. Return Status Format

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

Example of the Status ID Specification

\<A\>

\<ID\>01

\<V\>100\<H\>100\<P\>2\<L\>0202\<X20\>ABC

\<Q\>1

\<Z\>

8.5 Status 2 Return

This protocol is supported by the previous model.

8.5.1 Line Connection
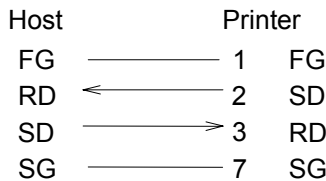
```
Host              Printer
FG  ───────── 1   FG
RD  ◄───────  2   SD
SD  ───────►  3   RD
SG  ───────── 7   SG
```

Note: **Some host types require that the CS and RS loop on the host side (always keep CS and RS "High").**

Therefore, the host type must be confirmed before connecting the line.

8.5.2 Input and Output Signal

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
7	SG	-	Signal Ground

8.5.3 Return Status

In this protocol, the status is returned to the host by issuing the Status Request command. In addition, the reception buffer is initialized and print is terminated with the Cancel Request command.

The following are details of each Request command and Return Status.

1) Status Request command

The condition of the data received, the buffer and the printer is sent to the host when receiving

this command.

1. Command   ENQ (Hex 05H)

2. Return Status Format

STX	Status 1	Status 2	Status 3	CR	LF	ETX	(7 Byte)

→ Printer status

→ Reception buffer status

→ Status of received data

STX (Hex 02H)
ETX (Hex 03H)
LF (Hex 0AH)
CR (Hex 0DH)
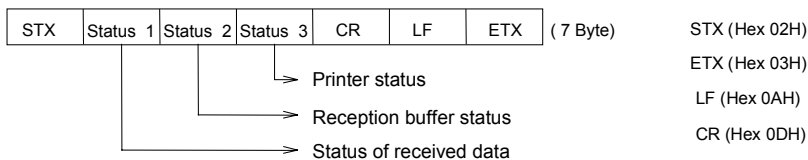
3. Status List

Condition of the received data

Status Return	Description
"0" (Hex 30H)	Shows that the data was successfully received.
"1" (Hex 31H)	Shows that there was an error during the data reception process (communication error or reception buffer overrun).

Condition of Reception Buffer

Status Return	Description
"0" (Hex 30H)	Shows that the reception buffer is empty.
"9" (Hex 39H)	Shows that the reception buffer is full.

Condition of the printer

Status Return	Description
"0" (Hex 30H)	Normal (data can be received)
"1" (Hex 31H)	Off-line or print stop
"@" (Hex 40H)	Ribbon end
"A" (Hex 41H)	Paper end
"B" (hex 42H)	Cutter error
"E" (Hex 45H)	Printer Head open
"G" (Hex 47H)	Printer Head error
"J" (Hex 4AH)	Card error

2) Cancel Request command

Printing is terminated and all data in the reception buffer is deleted when this command is received.

Since this command does not return the status, the next data should be sent after a 5m/s delay time interval, once the Cancel Request command has been sent. This command is also effective when the printer is off-line or an error occurs.

1. Command CAN (Hex 18H)

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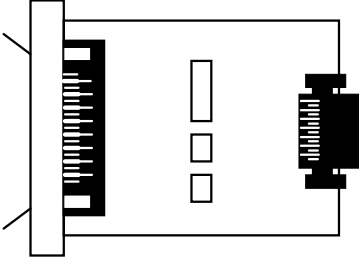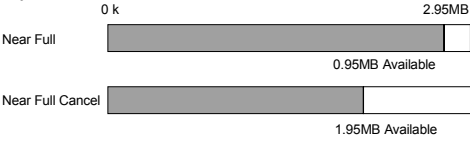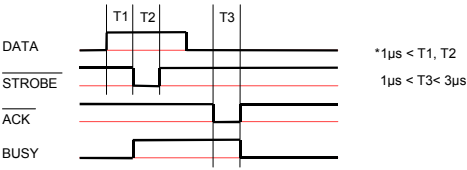
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9. Parallel Interface

9.1 Basic Specifications

The parallel interface of this printer complies with the centronics specifications.

There are two types of reception in the Reception Mode. They are the One Item Reception and the Multiple Reception and these can be set with the printer's DSW.

Interface Board	
Maximum Buffer Capacity	2. 95M byte
Connector	Printer Anphenol (DDK) 57 to 40360 (equivalent) Cable Anphenol (DDK) 57 to 30360 (equivalent) Cable Length Less than 3m
Signal Level	High Level: +2.4 to +5.0V Low Level: ?0.0 to ?0.4V
Timing Chart	

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9.2   Connector Pin Allocation

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	$\overline{\text{STROBE}}$	Input	19	STROBE-RETURN	SG
2	DATA 1	Input	20	DATA 1-RETURN	SG
3	DATA 2	Input	21	DATA 2-RETURN	SG
4	DATA 3	Input	22	DATA 3-RETURN	SG
5	DATA 4	Input	23	DATA 4-RETURN	SG
6	DATA 5	Input	24	DATA 5-RETURN	SG
7	DATA 6	Input	25	DATA 6-RETURN	SG
8	DATA 7	Input	26	DATA 7-RETURN	SG
9	DATA 8	Input	27	DATA 8-RETURN	SG
10	$\overline{\text{ACK}}$	Output	28	ACK -RETURN	SG
11	BUSY	Output	29	BUSY -RETURN	SG
12	PE	Output	30	PE -RETURN	SG
13	SELECT	Output	31		
14			32	FAULT	Output
15			33		
16			34		
17	FG	Frame Ground	35		
18	24KΩ (+5V)		36		
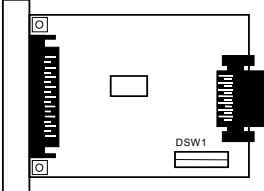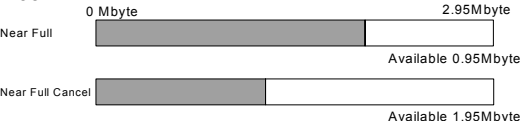
9.3   Description of the Input/Output Signal

Pin No.	Signal Name	Direction	Description
1	$\overline{\text{STROBE}}$	Input	The pulse width of the strobe pulse to read data should be set to more than 1µs. Data is imported from the front when the normal condition "High" becomes "Low".
2-9	DATA1 to DATA8	Input	DATA1 = LSB DATA8 = MSB Regular Logical Code ASCII or JIS7 and 8
10	$\overline{\text{ACK}}$	Output	A "Low" level pulse signal is sent to the host when the data is successfully imported.
11	BUSY	Output	The Output is executed at the "Low" level when the printer can receive data. An error or Buffer Near Full for reception with the printer occurs, and the "High" level is kept.
12	PE	Output	Label printing is completed and the level is "High" when there is no label setting.
13	SELECT	Output	When data is ready to receive, the "High" level is maintained, otherwise it becomes the "Low" level.
32	$\overline{\text{FAULT}}$	Output	When an error occurs with the printer, the level becomes "Low". Usually, the "High" level is maintained.

10. High Speed Serial Interface

The serial interface for this printer complies with the RS-232C specification.

10.1 Basic Specifications

Interface Board	
	DSW1

DSW1					
1) Character Structure 2) Transfer Rate 3) Protocol	1-1	Data Bit Length	OFF		8 bit
			ON		7 bit
	1-2 1-3	Parity Bit (2-3)	OFF	OFF	NONE
			OFF	ON	EVEN
			ON	OFF	ODD
			ON	ON	Not Used
	1-4	Stop Bit	OFF		1 bit
			ON		2 bit
	1-5 1-6	Baud Rate (5-6)	OFF	OFF	9600bps
			OFF	ON	19200bps
			ON	OFF	38400bps
			ON	ON	57600bps
	1-7 1-8	Protocol (7-8)	OFF	OFF	Ready/Busy
			OFF	ON	Xon-Xoff
			ON	OFF	Status 3
			ON	ON	Status 4 (DSW2-8 On = Status 2

* Switching between one item and multiple reception can be done with the printer's DSW2-5.

Synchronization Type	Pacing Synchronization Type
Maximum Reception Buffer Capacity	2.95MB
Codes Used	ASCII Character Codes (7 bits)
Connector	Printer Side DB-25S (Equivalent) (Male) Cable Side DB-25P (Equivalent) (Female) Cable Length Less than 5 m
Transfer Format	 Note: When a 7-bit unit is used, the b8 is omitted.
Signal Level	High Level: +5 to +12V Low Level: –5 to –12V

CT4xx:

Connector	Printer Side DB-25S (Equivalent) (Male)
	Cable Side DB-25P (Equivalent) (Female)
Cable Length	Less than 5 m
Signal Level	High Level: +5 to +12V Low Level: –5 to –12V
Synchronization Type	Pacing Synchronization Type
Codes Used	ASCII Character Codes (7 bits)
Transfer Format	

Start	b1	b2	b3	b4	b5	b6	b7	b8	Stop

Note: When a 7-bit unit is used, the b8 is omitted.

Communication Setting The following communication settings can be set with Printer Setting tools or I2 command.

Item	Range
Baud Rate	9600, 19200, 38400, 57600
Data Bit	7, 8
Parity Bit	None, odd, and even number
Stop Bit	1, 2
Protocol	ER Control (One Item Reception, Multiple Reception) Xon-Xoff Control, Status 4, Status 3

Interface Setting Since an interface has been provided through an extension board, set the DSW 8 off and select the extension interface.

DSW 8	Interface
ON	IEEE1284
OFF	Extended interface

Maximum Reception Buffer Capacity 2.95MB

```
              0 Mbyte                              2.95Mbyte
Near Full     [////////////////////////]
                                              Available 0.95Mbyte

Near Full Cancel  [////////////////]
                                              Available 1.95Mbyte
```
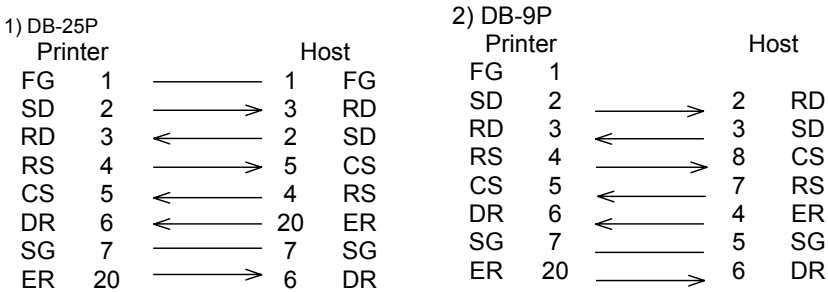
10.2 Ready/Busy

This protocol controls the reception of the print data using the hardware signal control without any software procedures. In addition, one item reception and multiple reception can be switched using DSW.

The receival of data is not guaranteed when the print data (STX + ESC+ "A" - ESC+ "Z" + ETX) is sent from the host under the following conditions:

1) When the printer is off-line.

2) When an error occurs with the printer.

10.2.1 Line Connection

```
1) DB-25P                                    2) DB-9P
   Printer                Host                  Printer                      Host
FG    1    ─────────  1  FG               FG    1
SD    2    ────────▶  3  RD               SD    2    ──────────▶  2  RD
RD    3    ◀────────  2  SD               RD    3    ◀──────────  3  SD
RS    4    ────────▶  5  CS               RS    4    ──────────▶  8  CS
CS    5    ◀────────  4  RS               CS    5    ◀──────────  7  RS
DR    6    ◀────────  20 ER               DR    6    ◀──────────  4  ER
SG    7    ─────────  7  SG               SG    7    ───────────  5  SG
ER    20   ────────▶  6  DR               ER    20   ──────────▶  6  DR
```

10.2.2 Description of the Input/Output Signal

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
4	RS	Output	A "Low" level results, when an error occurs.
5	CS	Input	Always keep it in "High".
6	DR	Input	Always keep it in "High".
7	SG	-	Signal Ground
20	ER	Output	The output is "High", when the printer accepts data. A "Low" level results, when an error occurs or the printer is off-line.

10.3 X-ON/OFF

This protocol instructs the host whether data can be received or not from the printer by sending the "XON" (hex digit 11H) or "XOFF" (hex digit 13H) code to the SD line.

It can also be switched between the One Item Reception and the Multiple Reception mode by using the DSW.

The receival of data is not guaranteed when the print data (STX + ESC+ "A" - ESC+ "Z" + ETX) is sent from the host under the following conditions:

1) When the printer is off-line.

2) When an error occurs with the printer.

10.3.1 Line Connection
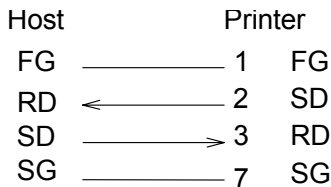
```
Host              Printer
 FG  —————— 1   FG
 RD  ←——————— 2   SD
 SD  ———————→ 3   RD
 SG  —————— 7   SG
```

Note: **Some host types require that the CS and RS loop on the host side (always keep CS and RS "High").**

10.3.2 Input and Output Signal

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
7	SG	-	Signal Ground

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10.4 Status 4 Return

The objective of this protocol is to control the printer status from the upper level host and return the status from the printer by receiving the request command from the host.
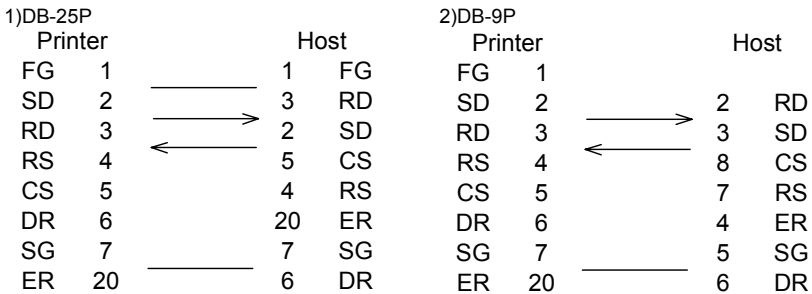
Please note that the status is immediately returned after receiving the request command.

When the return protocol is set, the reception mode is in the multiple reception.

10.4.1 Line Connection

```
1)DB-25P                                    2)DB-9P
   Printer            Host                    Printer            Host
  FG    1          1   FG                    FG    1
  SD    2          3   RD                    SD    2          2   RD
  RD    3          2   SD                    RD    3          3   SD
  RS    4          5   CS                    RS    4          8   CS
  CS    5          4   RS                    CS    5          7   RS
  DR    6         20   ER                    DR    6          4   ER
  SG    7          7   SG                    SG    7          5   SG
  ER   20          6   DR                    ER   20          6   DR
```

Note: **Some host types require that the CS and RS loop on the host side (always keep CS and RS "High"). Therefore the host type must be confirmed before connecting the line**

10.4.2 Input and Output Signal

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
7	SG	-	Signal Ground

10.4.3 Return Status

For this protocol, the printer condition and response are returned to the host as the status by receiving two types of request command or print command.

The following is a description of each request command and return status.

1) Status Request command

In Receiving this command, the ID number of the reception data that is currently being printed, the printer condition, the remaining paper and Job Name are returned to the host. When the printing is completed and it there is no reception data or ID number command specified, the ID number returns a space (hex digit 20H) and the print number returns all "0" (hex digit 30H).

1. Command ENQ (Hex 05H)

2. Return Status Format

3. Return Status List

Description			ASCII	Hex
Off-line condition	No Error		0	30
	Ribbon Near End		1	31
	Buffer Near Full		2	32
	Ribbon Near End and Buffer Near Full		3	33
	Print Stop (without error)		4	34
On-line condition	Wait for reception	No Error	A	41
		Ribbon Near End	B	42
		Buffer Near Full	C	43
		Ribbon Near End and Buffer Near Full	D	44
		Print Stop (without error)	E	45
	Printing	Without error	G	47
		Ribbon Near End	H	48
		Buffer Near Full	I	49
		Ribbon Near End and Buffer Near Full	J	4A
		Print Stop (without error)	K	4B
	Wait for dispenser and cut	Without error	M	4D
		Ribbon Near End	N	4E
		Buffer Near Full	O	4F
		Ribbon Near End and Buffer Near Full	P	50
		Print Stop (without error)	Q	51
	Analyze/Edit	Without error	S	53
		Ribbon Near End	T	54
		Buffer Near Full	U	55
		Ribbon Near End and Buffer Near Full	V	56
		Print Stop (without error)	W	57
Error Detection	Printer Head Open		b	62
	Paper End		c	63
	Ribbon End		d	64
	Media Error		e	65
	Sensor Error		f	66
	Printer Head Error		g	67
	Cover Open		h	68
	Card Error		i	69
	Cutter Error		j	6A
	Other Errors		k	6B

2) Cancel Request command

Once this command has been received, printing is terminated and all data in the reception buffer is deleted.

The status returned informs that the above procedure has been completed.

1. Command   CAN (Hex 18H)

2. Return Status list

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

3) Print Command

Once the print command has been received printing starts. (ESC+"A" - ESC+"Z").

The contents of the status inform that the printer has completed the reception process.

1. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

4) Print Stop Request

The printing stops when this command has been received.

The contents of the status inform that the printer has completed the reception process.

1. Command   DLE (Hex 10H)

2. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

5) Print Start Request

The printer cancels the Print Operation Stop mode and starts printing when this command has been received.

The contents of the status inform that the printer has completed the reception process.

1. Command   DC1 (Hex 11H)

2. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

For more details about ID commands, refer to the "Basic Command Reference".

10.4.4 Other Return Status

1) Printer Operation Setting Request

Printer Operation Setting is returned to the host when this command has been received.

1. Command SOH (01H) + MG

2. Return Status List

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No.	Item	Description	Byte
1	Print Type	00H: Thermal transfer 01H: Thermal	1
2	Printer Head Density	00H: 200 (dpi) 8 (head/mm) 01H: 300 (dpi) 12 (head/mm)	1
3	Print Speed	00H: 2 (inch/s) 50 (mm/s) 01H: 3 (inch/s) 75 (mm/s) 02H: 4 (inch/s) 100 (mm/s) 03H: 5 (inch/s) 125 (mm/s) 04H: 6 (inch/s) 150 (mm/s) 05H: 7 (inch/s) 175 (mm/s) 06H: 8 (inch/s) 200 (mm/s) 07H: 9 (inch/s) 225 (mm/s) 08H: 10 (inch/s) 250 (mm/s)	1
4	Print Operation	00H: Continuous 01H: Tear Off 02H: Cutter 03H: Dispenser 04H: Linerless	1
5	Cutter Operation	00H: Operation 1 (Printer Head position) 01H: Operation 2 (Cutter position) 02H: Operation 3 (No back feed)	1
6	Dispenser Operation	00H: Operation 1 (Printer Head position) 01H: Operation 2 (Dispenser position)	1
7	Linerless Operation	00H: Linerless (Cutter position) 01H: Linerless (No back feed)	1
8	Print Density	Density Specification A (41H) : A B (42H) : B C (43H) : C D (44H) : D E (45H) : E F (46H) : F Density level 00H : Density 1 01H : Density 2 02H : Density 3 03H : Density 4 04H : Density 5	2

No.	Item	Description	Byte
9	Sensor Type	00H:Reflection sensor (eye mark) 01H:See-through sensor (space between label) 02H:Sensor ignore type	1
10	0 Slash	00H: Invalid 01H: Valid	1
11	Kanji code	00H: JIS code 01H: Shift JIS code	1
12	Label Specification	00H: Adhesive Label 01H: Non-adhesive Label	1
13	Initial Feed	00H: Invalid 01H: Valid	1
14	Proportional Pitch	00H: Fixed pitch specification 01H: Proportional pitch specification	1
15	Vertical label size	00H-C80H(0-3200dot) 203dpi 00H-12C0H(0-4800dot) 305dpi	2
16	Horizontal label size	00H-340H(0-832dot) 203dpi 00H-4E0H(0-1248dot) 305dpi	2
17	Vertical starting point correction value	00H-3E7H(0-999dot) 203dpi FFFFH-FC19H(–1 - –999dot) 305dpi	2
18	Horizontal starting point correction value	00H-320H(0-800dot) FFFFH-FCE0H(–1 - –800dot)	2
19	Label Pitch Offset	00H-63H(0-99dot) FFH-9DH(–1 - –99dot)	1
20	Tear Off Offset	00H-63H(0-99dot) FFH-9DH(–1 - –9dot)	1
21	Cutter Off Offset	00H-63H(0-99dot) FFH-9DH(–1 - –99dot)	1
22	Dispenser Offset	00H-63H(0-99dot) FFH-9DH(–1 - –99dot)	1
23	Space size between label	08H-40H(8-64dot)	1
24	Alarm sound setting	00H: Enable 01H: Disable	1

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2) Printer Counter Information Request

The Printer Counter Information is returned when this command has been received.

1. Command SOH (01H) + ME

2. Return Status Format

"STX" + Life Counter + Head Counter 1 + head Counter 2 + Head Counter 3 +

Cutter Counter + Dispenser Counter + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	Life Counter	Current Counter (dot)	8
2	Head Counter 1	Current Head Counter (dot)	4
3	Head Counter 2	Previous Head Counter (dot)	4
4	Head Counter 3	Two Head Counters before (dot)	4
5	Cutter Counter	Current Cutter Counter (dot)	4
6	Dispenser Counter	Current Dispenser Counter (dot)	4

3) Sensor Level Information Request

The sensor level information is returned when this command is received.

1. Command   SOH (01H) + SG

2. Return Status Format

"STX" + Eye Mark Sensor Level + Gap Sensor Level + Dispenser Sensor + Head Open Sensor + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	Eye Mark Sensor Level	AD Converted Value "0-255" (Binary data)	1
2	Gap Sensor Level	AD Converted Value "0-255" (Binary data)	1
3	Dispenser Sensor	0: No Label	1
		1: With Label	
4	Head Open Sensor	0: Head Open	1
		1: Head Close	

4) Printer Head Status Request

The Head Condition Information of the printer is returned when this command has been received.

1. Command   SOH (01H) + HC

2. Return Status Format

      "STX" + Head Condition Flag + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	Head Condition Flag	0: Normal 1: Printer Head is run out	1

5) System Version Information Request

The System Version Information of the printer is returned when this command has been received.

1. Command   SOH (01H) + SB

2. Return Status Format

      "STX" + Printer System Version + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	OS	ASCII Code	10
2	Printer firmware	ASCII Code	10
3	Interface	ASCII Code	10
4	Font	ASCII Code	10
5	Font download	ASCII Code	10

6) Empty Memory Area Information Request

The Empty Memory Area Information of the printer is returned when this command has been received.

1. Command   SOH (01H) + EB

2. Return Status Format

"STX" + Empty Memory Area + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	Empty Area of Font	Binary Data	4
2	General Area of Font	Binary Data	4
3	Form Overlay Empty Area	Binary Data	4
4	Form Overlay General Area	Binary Data	4
5	Graphic Empty Area	Binary Data	4
6	Graphic General Area	Binary Data	4

7) Form Overlay Registration Information Request

The Form Overlay Registration Information is returned when this command has been received.

1. Command   SOH (01H) +FO

2. Return Status Format

"STX" + Form Overlay Registration Information + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	Registration Number	01-99 (ASCII code)	2
2	Registration number	Registration Name (ASCII code)	16

8) Character Structure Information Request

The Character Structure Information is returned when this command has been receiveds.

1. Command   SOH (01H) + FG

2. Return Status List

No.	Item	Description	Byte
1	Font ID Number	ASCII code specification	2
2	Logo/Character selection	0: Character 1: Logo	2
3	Font Name	ASCII code specification	32
4	Font Style (decor)	ASCII code specification	12
5	Font Size (point)	ASCII code specification	4
6	Character width	Dot specification (Binary code)	2
7	Character height	Dot specification (Binary code)	2
8	Font Size (one character byte)	Byte Specification (Binary code)	4
9	Font Registration Number	Binary code specification	4
10	Font Data Header Address	Binary Code	4
11	Total Size	Binary Code	4
12	Vertical Flag	Vertical/horizontal	2
13	Character Pitch	Fixed pitch/Variable pitch	1
14	Family	Family attribute	1
15	Character set	Character set	1
16	Italics	Italics attribute	1
17	Weight	Emphasis attribute	2
18	Average Character Width	Dot specification	2
19	Accent	Dot specification	2
20	Registration Start code	Registration Start code for one byte character	2
21	Registration End code	Registration End code for one byte character	2
22	Extra/Additional		8
23	Code	Binary Code	2
24	Horizontal Effective Size	Binary Code	2
25	Left Gap Size	Binary Code	2
.	.	.	.
.	.	.	.
.	Code	Binary Code	2
.	Horizontal Effective Size	Binary Code	2
.	Left Gap Size	Binary Code	2

9) Interface Connection Information Request

The Interface Connection Information is returned when this command has been received.

The above command works only with the ET/ER series.

1. Command   SOH (01H) +IG

2. Return Status Format

    "STX" + Interface Connection Type + "ETX"

3. Return Status List

No.	Item	Description	Byte
1	Interface Connection Type	0: IEEE1284 1: Serial 2: LAN 3: USB	1

10) Serial Interface Specification Information Request

The Serial Interface Specification Information is returned when this command is received.

The above command works only with the ET/ER series.

1. Command   SOH (01H) + H2

2. Return Status Format

    "STX" + Serial Interface Specification Information + "ETX"

3. Return Status List

| No.	Item	Description	Byte
1	Baud Rate	0: 9600 1: 19200 2: 38400 3: 57600	1
2	Date bit	0: 8bit 1: 7bit	1
3	Parity bit	0: Non Party 1: Odd 2: Even	1
4	Stop bit	0: 1bit 1: 2bit	1
5	Control	0: ER Control (One Item Reception) 1: ER Control (Multiple Reception) 2: Xon-Xoff Control 3: Status 4 4: Status 3	1

10.5 Return Status 3

With the above protocol protocol, the status of the printer is returned to the host by activating the Status Request command in order to be able to control the printer from the host. Please note that the status is returned immediately after receiving the request command.

When this communication protocol is set, the reception mode is in Multiple Reception.

The receival of data is not guaranteed when the print data (STX + ESC+ "A" - ESC+ "Z") is sent from the host under the following conditions:

1) When the printer is off-line.

2) When an error occurs with the printer.

10.5.1 Line Connection
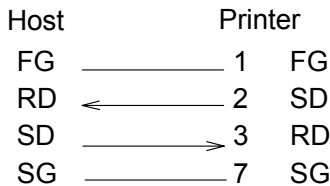
```
    Host            Printer
    FG  _____ 1   FG
    RD  <_____ 2   SD
    SD  _____> 3   RD
    SG  _____ 7   SG
```

Note: Some host types require that the CS and RS loop on the host side (always keep CS and RS "High").

10.5.2 Input and Output Signal

Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	Data transferred from the printer to the host
3	RD	Input	Data transferred from the host to the printer
7	SG	-	Signal Ground

10.5.3 Return Status

The printer condition and response are returned as status to the host by receiving two types of request command or print command.

The following is a description of each request command and return status.

1) Status Request command

Receiving this command, the ID number of the reception data that is currenctly printing, the printer condition and the amount of paper remaining are returned to the host. When the printing is completed, and if there is no reception data or ID number command, the ID number returns a space (hex digit 20H) and the print number returns all "0" (hex digit 30H).

1. Command   ENQ (Hex 05H)

2. Return Status Format

      STX(Hex 02H)

      ETX(Hex 03H)

STX	ID Number	Status	Remaining Print Number	ETX	(11 Byte)
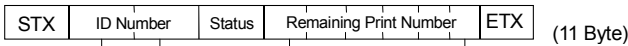
                        ⮡ From 000000 to 999999

⮡ The ID number is set according to the ID number command specified by ESC+ "A" - ESC+ "Z". If there is more than one reception data, the ID number of the reception data that is currently being printed is returned.

3. Status List

Description			ASCII	Hex
Off-line condition	No Error		0	30
	Ribbon Near End		1	31
	Buffer Near Full		2	32
	Ribbon Near End and Buffer Near Full		3	33
On-line condition	Wait for reception	No Error	A	41
		Ribbon Near End	B	42
		Buffer Near Full	C	43
		Ribbon Near End and Buffer Near Full	D	44
	During Printing	No Error	G	47
		Ribbon Near End	H	48
		Buffer Near Full	I	49
		Ribbon Near End and Buffer Near Full	J	4A
	Wait for dispenser	No Error	M	4D
		Ribbon Near End	N	4E
		Buffer Near Full	O	4F
		Ribbon Near End and Buffer Near Full	P	50
	Analyze/Edit	No Error	S	53
		Ribbon Near End	T	54
		Buffer Near Full	U	55
		Ribbon Near End and Buffer Near Full	V	56
Error detection (Off-line condition)	Reception Buffer Full		a	61
	Printer Head Open		b	62
	Paper End		c	63
	Ribbon End		d	64
	Media Error		e	65
	Sensor Error		f	66
	Printer Head Error		g	67
	Cover Open		h	68
	Card Error		i	69
	Cutter Error		j	6A
	Other Errors		k	6B

The print number may no be set according to the edit/analyze timing.

2) Cancel Request command

Printing is terminated and all data in the reception buffer is deleted when this command is received.

The status returned informs that the above procedure has been completed.

1. Command CAN (Hex 18H)

2. Return Status and Format

Status Return	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

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3) Print command

Once the print command has been recelved printing starts. (ESC+"A" - ESC+"Z").

The contents of the status inform that the printer has completed the reception process.

1. Return Status and Format

Status Return	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

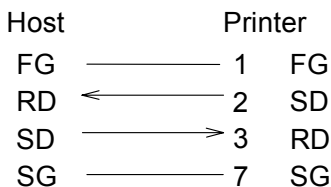Example of Status ID Specification:

\<A\>

\<ID\>01

\<V\>100\<H\>100\<P\>2\<L\>0202\<XU\>ABC

\<Q\>1

\<Z\>

10.6 Return Status 2

This protocol offers compatibility with the previous models.

10.6.1 Line Connection

```
Host           Printer
 FG  ————————  1  FG
 RD  ◄————————  2  SD
 SD  ————————►  3  RD
 SG  ————————  7  SG
```

Note: **Some host types require that the CS and RS loop on the host side (always keep CS and RS "High"). Therefore, the host type must be confirmed before connecting the line.**

10.6.2 Input and Output Signal

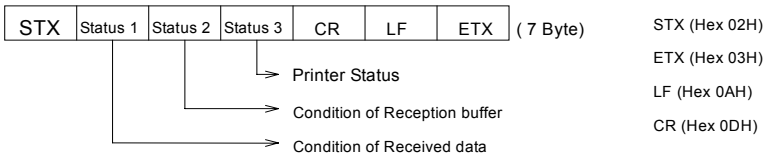| Pin No.	Signal Name	Direction	Description
1	FG	-	Frame Ground
2	SD	Output	The data transferred from the printer to the host.
3	RD	Input	The data transferred from the host to the printer.
7	SG	-	Signal Ground

10.6.3 Return Status

The printer condition and response are returned as the status to the host by receiving two types of request command or print command. The following is a description of each request command and return status.

1) Status Request command

When this command is received, the condition of the data received, the buffer and the printer are sent to the host.

1. Command   ENQ (Hex 05H)

2. Return Status Format

| STX | Status 1 | Status 2 | Status 3 | CR | LF | ETX | (7 Byte) |

Printer Status

Condition of Reception buffer

Condition of Received data

STX (Hex 02H)
ETX (Hex 03H)
LF (Hex 0AH)
CR (Hex 0DH)

3. Status List

Condition of Received data

Status Return	Description
"0" (Hex 30H)	Shows that the text is received without error.
"1" (Hex 31H)	Shows that the text is received with error (communication error or reception buffer overrun).

Condition of Reception buffer

Status Return	Description
"0" (Hex 30H)	Shows that the reception buffer is empty.
"9" (Hex 39H)	Shows that the reception buffer is full.

Printer Status

Status Return	Description
"0" (Hex 30H)	Normal (data ready to receive)
"1" (Hex 31H)	Off-line or printing is stopped
"@" (Hex 40H)	Ribbon End
"A" (Hex 41H)	Paper End
"B" (Hex 42H)	Cutter Error
"E" (Hex 45H)	Printer Head Open
"G" (Hex 47H)	Printer Head Error
"J" (Hex 4AH)	Card Error

2) Cancel Request command

Printing is terminated and all data in the reception buffer is deleted when this command is received.

Since this command does not return the status, the next data should be send after a 5 m/s delay time interral, once the Cancel Request command has been sent. This command is also effective when the printer is off-line or an error occurs.

1. Command CAN (Hex 18H)

11. IEEE 1248 Interface

The parallel interface for this printer complies with the Centronics/IEEE1284 specification.

11.1 Basic Specifications

Connector	Printer Amphenol (DDK) 57-40360 (equivalent) Cable Amphenol (DDK) 57-30360 (equivalent)
Cable Length	Less than 3m
Signal Level	High Level : +2.4 to +5.0V Low Level : −0.0 to −0.4V
Setting Communication State	Either the One/Multiple Item mode communication can be selected with the DSW 2-5 (enhanced series) <table><tr><td>DSW 2-5</td><td>Communication State</td></tr><tr><td>ON</td><td>One Item Reception</td></tr><tr><td>OFF</td><td>Multiple Reception</td></tr></table> The following communication state can be set with the <I1> command. <table><tr><td>Item</td><td>Setting Area</td></tr><tr><td>Control</td><td>One/Multiple Item Reception</td></tr></table> (CT series only)
Interface Setting	Only for the CT4xx series. Since a parallel interface is the standard interface, if an extended interface is connected to the printer, select the parallel interface by turning the DSW 8 ON. <table><tr><td>DSW 8</td><td>Interface</td></tr><tr><td>ON</td><td>IEEE1284</td></tr><tr><td>OFF</td><td>Extended Interface</td></tr></table>
Maximum Reception Buffer Capacity	2.95MB 0MB 2.95MB Near Full � Remaining 0.95MB Near Full Cancel Remaining 1.95MB

11.2   Line Connection

The following is the parallel cable line connection that comes with the printer.

Please use an IEEE1284 standard cable (accessory).

D-SUB 25P   **Microribbon 36P**

GND		GND
1 / 18	—	1 / 19
2 / 19	—	2 / 20
3 / 19	—	3 / 21
4 / 20	—	4 / 22
5 / 20	—	5 / 23
6 / 21	—	6 / 24
7 / 21	—	7 / 25
8 / 22	—	8 / 26
9 / 22	—	9 / 27
10 / 24	—	10 / 28
11 / 23	—	11 / 29
12 / 24	—	12 / 28
13 / 24	—	13 / 28
14 / 25	—	14 / 30
15 / 23	—	32 / 29
16 / 25	—	31 / 30
17 / 25	—	36 / 30
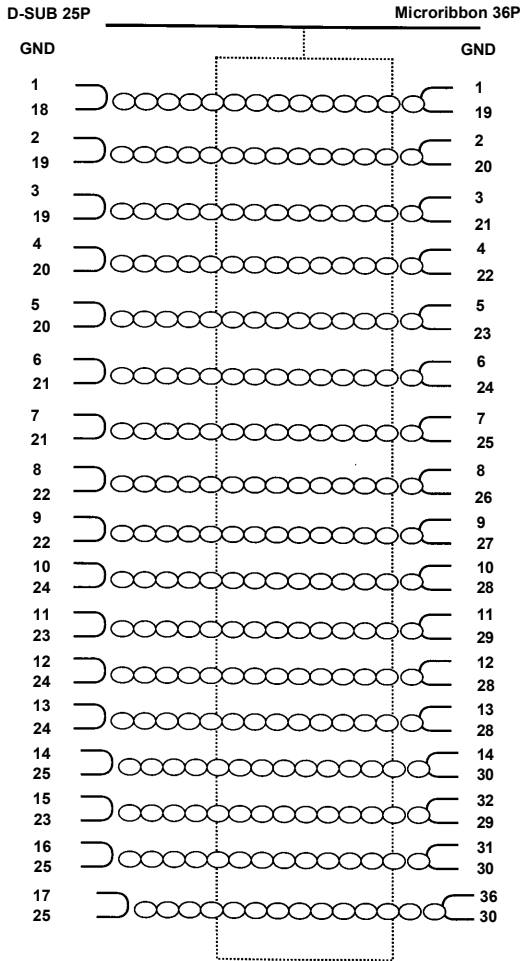
11.3 Connector Pin Allocation

The following is the pin allocation for each signal when the pin complies with the centronics standard. Please note that when compliant with the IEEE1284 standard, the line connection complies with the IEEE1284-B Type connector standard.

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	nStrobe	Input	19	Signal Ground	
2	Data 1	Input	20	Signal Ground	
3	Data 2	Input	21	Signal Ground	
4	Data 3	Input	22	Signal Ground	
5	Data 4	Input	23	Signal Ground	
6	Data 5	Input	24	Signal Ground	
7	Data 6	Input	25	Signal Ground	
8	Data 7	Input	26	Signal Ground	
9	Data 8	Input	27	Signal Ground	
10	nAck	Output	28	Signal Ground	
11	Busy	Output	29	Signal Ground	
12	Perror	Output	30	Signal Ground	
13	Select	Output	31	nInit	Input
14	nAutoFd	Input	32	nFAULT	Output
15			33		
16	Logic GND		34		
17	Chassis Gnd		36		
18	Peripheral Logic High	Input	36	nSELECTIN	Input

11.4 The Input and Output Signal

When the pin complies with the centronics standard, each signal line connection is as follows. Please note that when compliant with the IEEE1284 standard, each signal line connection complies with the IEEE1284 standard.

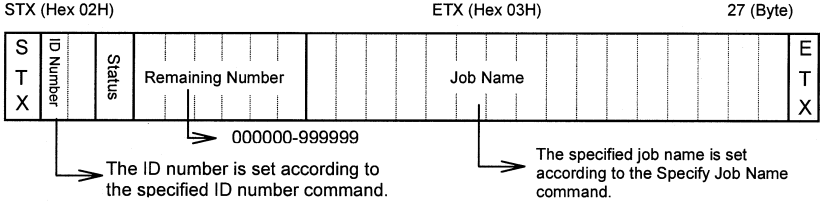| Pin No.	Signal Name	Direction	Description
1	nStrobe	Input	This is the synchronization signal to read from Data 1 to Data 8 so a LOW active pulse is required.
2 - 9	Data 1 - Data 8	Input	Data 1 is LSB (the lowest level bit) for Data input of 8 bits parallel and Data 8 is MSB (the highest level bit).
10	nAck	Output	This is a pulse signal of LOW active and indicates that the data received has been imported.
11	Busy	Output	This is a HIGH active signal and indicates that the printer cannot receive data.
12	Perror	Output	This is a HIGH active signal and indicates that the labels are running out.
13	Select	Output	This is a HIGH active signal and indicates that the printer can receive data.
14	nAutoFd	Input	This is a signal when the IEEE1284 standard is employed.
17	Chassis Gnd		This is connected to the frame ground.
18	Peripheral Logic High	Output	The voltage of the printer is +5V.
19 - 30	Signal Ground		This is connected to the ground for each signal.
31	nInit	Input	This is a pulse signal for LOW active that requires initialization of the printer.
32	nFault	Output	This is a pulse signal for LOW active and indicates that an error occurred with the printer.
36	nSelecetin	Input	This is a signal when IEEE1284 is employed.

11.5 Return Status

For this protocol, the printer condition and response are returned as the status to the host by receiving two types of request command or print command. The following is a description of each request command and return status.

1) Status Request command

Receiving this command, the ID number of the data that is currently being printed, the printer condition and the remaining paper are returned to the host. If the printing is completed and if there is no reception data or the ID number command is not specified, the ID number returns a space (Hex 20H) and the print number returns all "0" (Hex 30H).

1. Command   ENQ (Hex 05H)

2 .Return Status Format

STX (Hex 02H)   ETX (Hex 03H)   27 (Byte)

S T X	ID Number	Status	Remaining Number					Job Name									E T X

000000-999999

The ID number is set according to the specified ID number command.

The specified job name is set according to the Specify Job Name command.

3. Return Status List

Description			ASCII	Hex
Off-line	No Error		0	30
	Ribbon Near End		1	31
	Buffer Near Full		2	32
	Ribbon Near End and Buffer Near Full		3	33
	Print Stop (without error)		4	34
On-line	Wait for reception	Without error	A	41
		Ribbon Near End	B	42
		Buffer Near Full	C	43
		Ribbon Near End and Buffer Near Full	D	44
		Print Stop (without error)	E	45
	Printing	Without error	G	47
		Ribbon Near End	H	48
		Buffer Near Full	I	49
		Ribbon Near End and Buffer Near Full	J	4A
		Print Stop (without error)	K	4B
	Wait for dispenser and cut	Without error	M	4D
		Ribbon Near End	N	4E
		Buffer Near Full	O	4F
		Ribbon Near End and Buffer Near Full	P	50
		Print Stop (without error)	Q	51
	Analyze/Edit	Without error	S	53
		Ribbon Near End	T	54
		Buffer Near Full	U	55
		Ribbon Near End and Buffer Near Full	V	56
		Print Stop (without error)	W	57
Error Detection	Printer Head Open		b	62
	Label End		c	63
	Ribbon End		d	64
	Media Error		e	65
	Sensor Error		f	66
	Printer Head Error		g	67
	Cover Open		h	68
	Card Error		i	69
	Cutter Error		j	6A
	Other Errors		k	6B

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2) Cancel Request command

Once this command has been received, printing is terminated and all data in the reception buffer is deleted.

The status returned informs that the above procedure has been completed.

1. Command   CAN (Hex 18H)

2. Return Status list

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

3) Print Command

Once the print command has been received printing starts. (ESC+"A" - ESC+"Z").

The contents of the status inform that the printer has completed the reception process.

1. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

4) Print Stop Request

The printing stops when this command has been received.

The contents of the status inform that the printer has completed the reception process.

1. Command   DLE (Hex 10H)

2. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

5) Print Start Request

The printer cancels the Print Operation Stop mode and starts printing when this command has been received.

The contents of the status inform that the printer has completed the reception process.

1. Command   DC1 (Hex 11H)

2. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

For more details about ID commands, refer to the "Basic Command Reference".

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12. LAN Interface

12.1 Software Specifications

Supported Protocol	TCP/IP (Transmission Control Protocol/Internet Protocol)
Network Layer	ARP (Address Resolution Protocol), RARP (Reverse Address Resolution Protocol), IP (Internetwork Protocol), ICMP (Internet Control Message Protocol)
Session Layer	TCP (Transmission Control Protocol), UDP (User Datagram Protocol)
Application Layer	LPR, FTP (File Transfer Protocol), TELNET, BOOTP (Bootstrap Protocol), DHCP (Dynamic Host Configuration Protocol)

- The Print data can be transferred by using LPR of TCP/IP, FTP and the original Socket protocols.
- The printer status can be obtained through the Socket.

12.2 TCP/IP Specifications

The LPD and FTP can be used as printing protocols with TCP/IP protocol. TELNET can be used to set/change the parameters. Frthermore the parameters and IP address can be set from Windows using the utility "IPSETUP".

For more information, refer to the "Printer Driver Documentation".

The Printing and status are monitored under the Socket I/F. However, multiple connections cannot be maintained simultaneously with one socket connection.

The LPD of the TCP/IP is supported under Windows NT. Since the LPD is not available under Windows 95/98, printing cannot be done. However, you can print directly by using application software available from a PC shop.

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12.3 LPD Specifications

The LPD protocol is compatible with RFC1179 and processes the list of logical printer names as queue names. There are three queue names such as lp, sjis and euc.

In addition, a banner page can be printed when you setup the parameters properly.

Queue Name	Kanji Filter Application	Input Kanji Code
lp	No	N/A
sjis	Yes	Shift JIS
euc	Yes	EUC

When a job is sent by lpr, the transmission sequence of the data file/control file does not affect the printing operation. In addition, when a banner page is set, a banner page is added for each data file.

Job cancellation by lpr is not supported.

12.4 FTP Specifications

The FTP protocol is compatible with RFC959. It processes the list of logical printer names according to the transfer direction directory and the file transfer that is executed as the printing operation for the directory. Please note that ASCII (A), BINARY (I) or TENEX (L8) can be specified but the mode depends on the client.

In addition, a banner page can be printed when the parameters are setup properly.

There are three directory names such as lp, sjis and euc.

Queue Name	Kanji Filter Application	Input Kanji Code
lp	No	N/A
sjis	Yes	Shift JIS
euc	Yes	EUC

12.5 TELNET Specifications

The TELNET protocol is compatible with RFC854. This interface is of an interactive menu type and Change to Internal Setting, Reference and View Status is possible. In order to change the setting, you must enter the 'root' user and password when logging in. There is no default setting for the ROOT password (Return only).

<Example of TELNET command execution>

The following messages appear when you enter "TELNET xxx.xxx.xxx.xxx (IP address)" upon a MS-DOS command prompt.

SATO ET/ER Series Ver 1.0.0.0 TELNET server.

Copyright 1999(C) SATO Corporation.

login: root

'root' user needs password to login

password:

User 'root' logged in


```
 No. Message            Value        (level.1)
-----------------------------------------------------------------
  1 : Setup TCP/IP
  2 : Setup printer port
  3 : Display status
 96 : Rest to factory set
 97 : Reboot
 98 : Quit setup
 99 : Exit setup
Please select(1-99)?
```

For more information on [1: Setup TCP/IP] and [2: Setup printer port], refer to 7. Setting/Display Item.

12.6 Other Specifications

Each function for the DSW of the LAN interface card is assigned as follows:

DSW	ON	OFF
SW-1	Not Used	Default
SW-2	EEPROM Initialization	-
SW-3	Setting Information Print	-
SW-4	Print Diagnosis Print	-

Each LED executes the following operation while an application is running.

LED	Operation
LINK10	Lights up when an application recognizes the connection as a 10BASE-T.
LINK100	Lights up when an application recognizes the connection as a 100BASE-TX.
STAT	Lights up at a constant interval (10msec) when a packet is received.

Caution: Always turn OFF the first DSW of the LAN interface card.

12.7 Setting/Display Item

The following are sections and parameters that can be set or referred to.

TCP/IP Related Setting

Parameter Name	Setting Range	Default Setting (Factory Preset)
TCP/IP protocol	ENABLE/DISABLE	ENABLE
IP address	0.0.0.0 - 255.255.255.255	0.0.0.0 (Acquired externally)
Subnet mask	0.0.0.0 - 255.255.255.255	0.0.0.0 (Calculated by IP address)
Gateway address	0.0.0.0 - 255.255.255.255	0.0.0.0
RARP protocol	ENABLE/DISABLE	ENABLE
BOOTP protocol	ENABLE/DISABLE	ENABLE
ROOT password	Any alphanumeric string [7]	No password

Printer Port Related Setting

Parameter Name	Setting Range	Default Setting (Factory Preset)
BOJstring	Any string and special string [31] (*1)	Null
EOJstring	Any string and special string [31] (*1)	Null
BOJstring(KANJI)	Any string and special string [31] (*1)	Null
EOJstring(KANJI)	Any string and special string [31] (*1)	Null
PRINTER type	ASCII, SJIS, EUC, LIPS, PR201, PR201-E, ESC/P, ESC/P-E, ESC/Page, FMPR, N5263, J31, PS	ESC/P-E
TAB size	0-16	8
Page width	0-255	0
Page length	0-255	0
Banner output	NO/YES	NO

* The value in [ ] is a limited number.

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(*1) The following alternative expression can be used with the special string.

Alternative Expression	Corresponding Code
\b	Backspace code (0x08)
\t	Tab code (0x09)
\n	Return code (0x0d)
\v	Vertical tab code (0x0b)
\r	Carriage return code (0x0a)
\f	Page feed code (0x0c)
\xnn	Hexadecimal code expressed by nn (0xnn)
\"	" mark (0x22)
\\	\ mark (0x5c)

12.8   Socket Communication

Port1024 is used for printing data and Port1025 is used for printer status return (the port number is fixed) when the TCP/IP Socket server function is used.

However, each Socket cannot connect to multiple sessions.

When the print data is being transferred, the LPR and FTP can be used instead of the Socket. While LPR or FTP is connecting, the Socket (Port1024) cannot be connected.
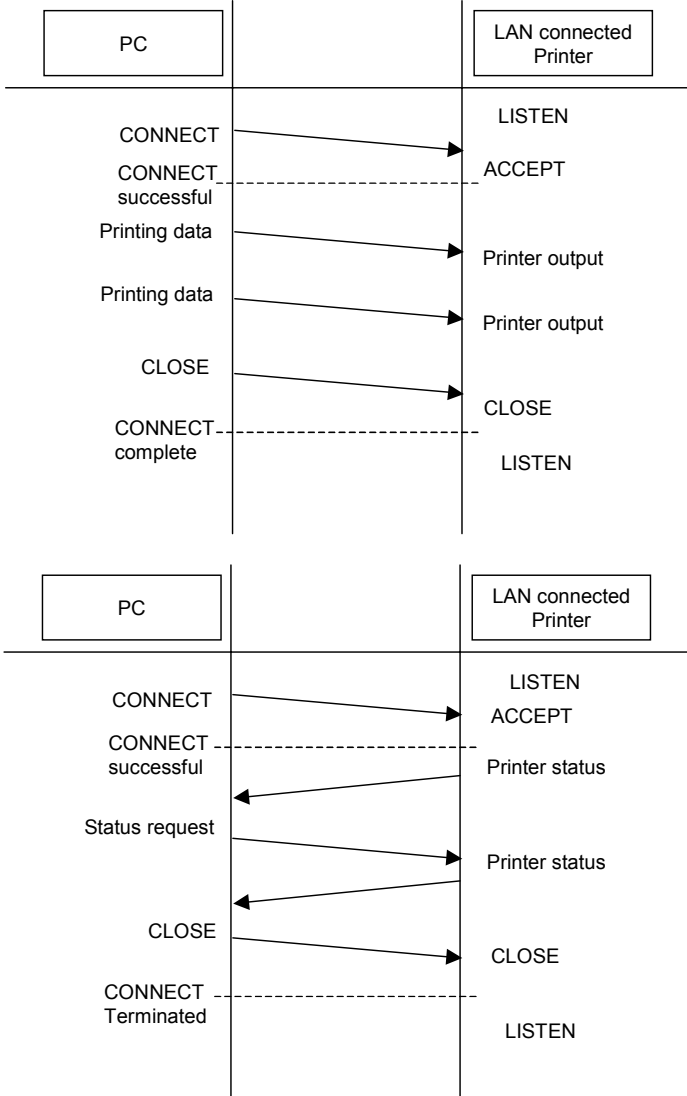
1) When printing is executed by Socket.
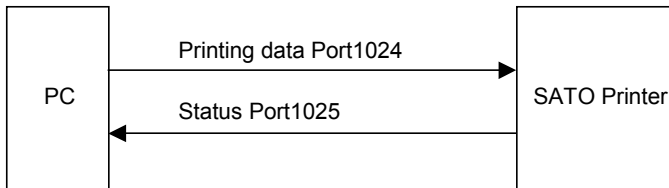
2) When printing is executed by LPR or FTP.
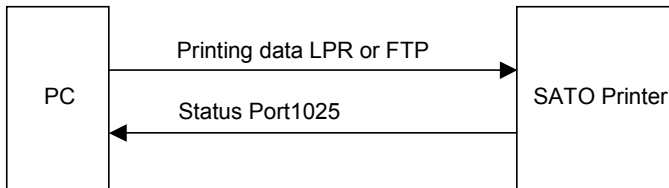
12.9   Session Connection/Disconnection

The connection and disconnection of the printing data port (Port1024) and the status return port (Port1025) are executed as follows when the Socket server function is used.

12.10 Printer Status

There are three types of statuses returned form the LAN interface.

1) 2 Port Connections/Periodic Response Mode (Status 4)

1024 is used for the data port and 1025 for the status return.

The printer status is output periodically. In addition, the update printer status is output with the Status Request command.

2) 2 Port Connections/ENQ Response Mode (Status 4)

1024 is used for the data port and 1025 for the status return.

The printer status is output with the Status Request command received from the host.

3) One Port Connection/ENQ Response Mode (Status 3) (only for e series).

1024 is used for both the data port and status response port.

ACK is output using the Print Request command received from the host and the Printer

Status is output using the Status Request command.

The status mode is switched with the DSW as shown below (only for „e" series).

DSW		Protocol
2-5	2-8	
ON	OFF	2 Port Connections/Periodic Response (Default)
OFF	ON	Not used
OFF	OFF	2 Port Connections/ENQ Response
ON	ON	1 Port Connections/ENQ Response

4) Status Response Data Type

1) 2 Port Connections

| Sending Byte 4 bytes 00h00h00h1Bh	ENQ 1 byte 05h	STX 1 byte 02h	ID Number 2 bytes	Status 1 byte	Remaining Number 6 bytes	JOB Name 16 bytes	ETX 1 byte 03h

2) 1 Port Connection

STX 1 byte 02h	ID Number 2 bytes	Status 1 byte	Remaining Number 6 bytes	ETX 1 byte 03h

For more information on the "status (one byte)", refer to the 11. Return Status.
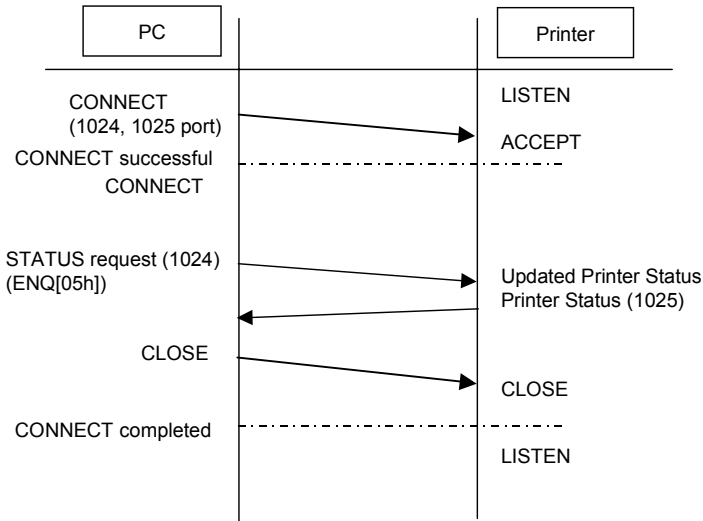
1) Port Setting/Periodic Response Mode (Status 4)

The status is returned at an interval of 500ms to 1000ms from the printer. In addition, when the Status Request command (ENQ: 05h) is received from the PC, the update printer status data is returned.
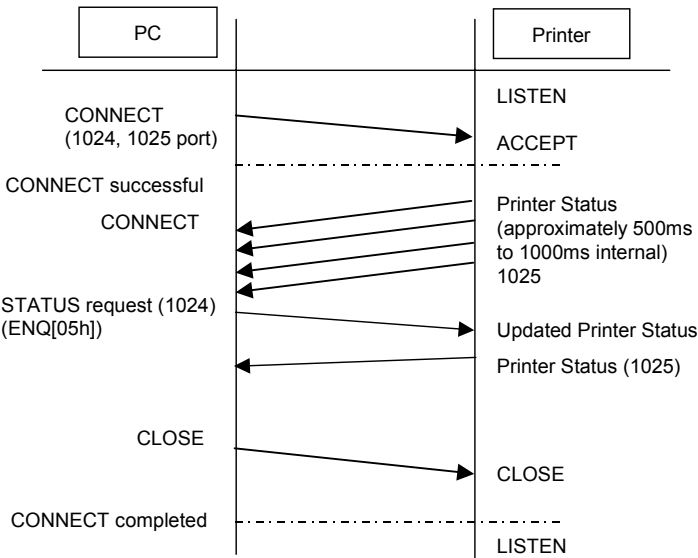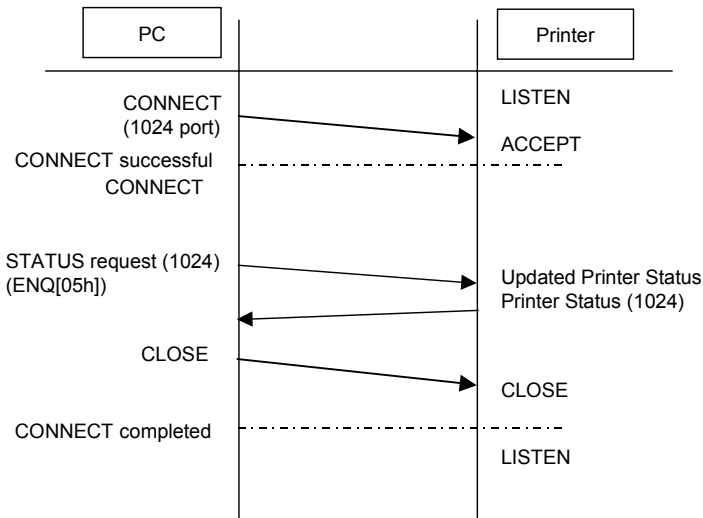
2) 2 Port Connection/ENQ Response Mode (Status 4)

The update printer status is returned after receiving the Status Request command (ENQ: 05h) from the PC.

PC		Printer
		LISTEN
CONNECT (1024, 1025 port)		ACCEPT
CONNECT successful CONNECT		
STATUS request (1024) (ENQ[05h])		Updated Printer Status Printer Status (1025)
CLOSE		CLOSE
CONNECT completed		LISTEN

3) 1 Port Connection/ENQ Response Mode (Status 3)

ACK is output by the Print Request command received from the host and the Printer Status is output by the Status Request command.

PC		Printer
		LISTEN
CONNECT (1024 port)		ACCEPT
CONNECT successful CONNECT		
STATUS request (1024) (ENQ[05h])		Updated Printer Status Printer Status (1024)
CLOSE		CLOSE
CONNECT completed		LISTEN

10.11 Return Status

For this protocol, the printer condition and response are returned as the status to the host by receiving two types of request command or print command. The following is a description of each request command and return status.

1) Status Request command

Receiving this command, the ID number of the data that is currently being printed, the printer condition and the remaining paper are returned to the host. If printing is completed, and there is no reception data or the ID number command is not specified, the ID number returns a space (hex digit 20H) and the print number returns an all "0" (hex digit 30H).

(1) CommandENQ (hex digit 05H)

(2) Return Status List

Description			ASCII	Hex
Off-line condition	No Error		0	30
	Ribbon Near End		1	31
	Buffer Near Full		2	32
	Ribbon Near End and Buffer Near Full		3	33
	Print Stop (without error)		4	34
On-line condition	Wait for reception	No Error	A	41
		Ribbon Near End	B	42
		Buffer Near Full	C	43
		Ribbon Near End and Buffer Near Full	D	44
		Print Stop (without error)	E	45
	Printing	Without error	G	47
		Ribbon Near End	H	48
		Buffer Near Full	I	49
		Ribbon Near End and Buffer Near Full	J	4A
		Print Stop (without error)	K	4B
	Wait for dispenser and cut	No error	M	4D
		Ribbon Near End	N	4E
		Buffer Near Full	O	4F
		Ribbon Near End and Buffer Near Full	P	50
		Print Stop (without error)	Q	51
	Analyze/ Edit	No error	S	53
		Ribbon Near End	T	54
		Buffer Near Full	U	55
		Ribbon Near End and Buffer Near Full	V	56
		Print Stop (without error)	W	57
Error Detection	Head Open		b	62
	Label End		c	63
	Ribbon End		d	64
	Media Error		e	65
	Sensor Error		f	66
	Head Error		g	67
	Cover Open		h	68
	Card Error		i	69
	Cutter Error		j	6A
	Other Errors		k	6B

2) Cancel Request command

Once this command has been received, printing is terminated and all data in the reception buffer is deleted.

The status returned informs that the above procedure has been completed.

1. Command   CAN (Hex 18H)

2. Return Status list

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

3) Print Command

Once the print command has been received printing starts. (ESC+"A" - ESC+"Z").

The contents of the status inform that the printer has completed the reception process.

1. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

4) Print Stop Request

The printing stops when this command has been received.

The contents of the status inform that the printer has completed the reception process.

1. Command   DLE (Hex 10H)

2. Return Status List

Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

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5) Print Start Request

The printer cancels the Print Operation Stop mode and starts printing when this command has been received.

The contents of the status inform that the printer has completed the reception process.

1. Command   DC1 (Hex 11H)

2. Return Status List

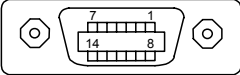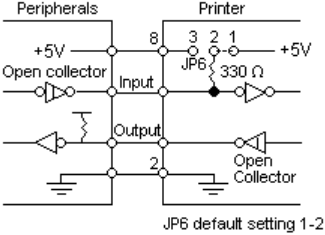| Return Status	Description
ACK (Hex 06H)	Shows that there is no error with the printer.
NAK (Hex 15H)	Shows that there is an error with the printer.

For more details about ID commands, refer to the "Basic Command Reference".

Note   **When the printer data port (1024 port) and the status port (1025 port) are opened or closed, a 150msec - 200msec interval is required. If the period between opening after closing is too short, the connection will be duplicated. A duplicated connection is permitted for the connection (SOCKET OPEN) port (1024 or 1025) but if another "CONNECT" request is issued, the second "CONNECT" is disconnected (SOCKET CLOSE).**

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13. External Signal Interface

This printer uses an external signal to interface external devices. The external signal interface only works with the pulse input of a dispenser (printing is executed by entering an external signal).

However, when an error occurs with the printer, an error signal is output for the All mode.

Connector	
Input/Output Circuit	
Signal Level	High Level: +2.4 to +5.0 V Low Level: +0.0 to +0.4 V

13.1   Connector Pin Allocation

Pin No.	Signal Name	Description	Input/ Output	Level	Power Requirement (Voltage and current (Max))
1	Label End	Output when the end of the label is detected	Output	LOW	5V 400mA
2	GND	Signal ground	–	–	–
3	Ribbon End	Output when the end of the ribbon is detected	Output	LOW	5V 400mA
4	Machine Error	Output when an error occurs (printer head open, printer head error, or transfer error)	Output	LOW	5V 400mA
5	Print Start Signal (PRIN)	A label is printed each time this signal is entered	Input	LOW	High: impedance Low: −15mA or more, 0V
6	1Print Completion Signal (PREND)	Output when the printer had finished a label.	Output	LOW	5V 400mA
7	Print Repeat Signal (PRIN2)	Re-print a label that is identical to the previous one.	Input	LOW	High: impedance Low: −15mA or more, 0V
8	Vpu	Open collector voltage	Input	–	–
9	2Status-Mode	Online / Offline Compiling ready	Output	–	–
10	Ribbon near end	Output when the remaining Ribbon is ~15m	Output	High	–
11	NC	Not Connected	–	–	–
12	+24V	–	Output	–	2A
13	+5V	–	Output	–	500mA
14	FG	Frame Ground	–	–	–

1 Signal only when print start active (DIP-SW 3-5 ON)

2 Signal selectable by LCD setting (from Firmware Version 2030)

13.2 Input/Output Signal

1) Input Signal
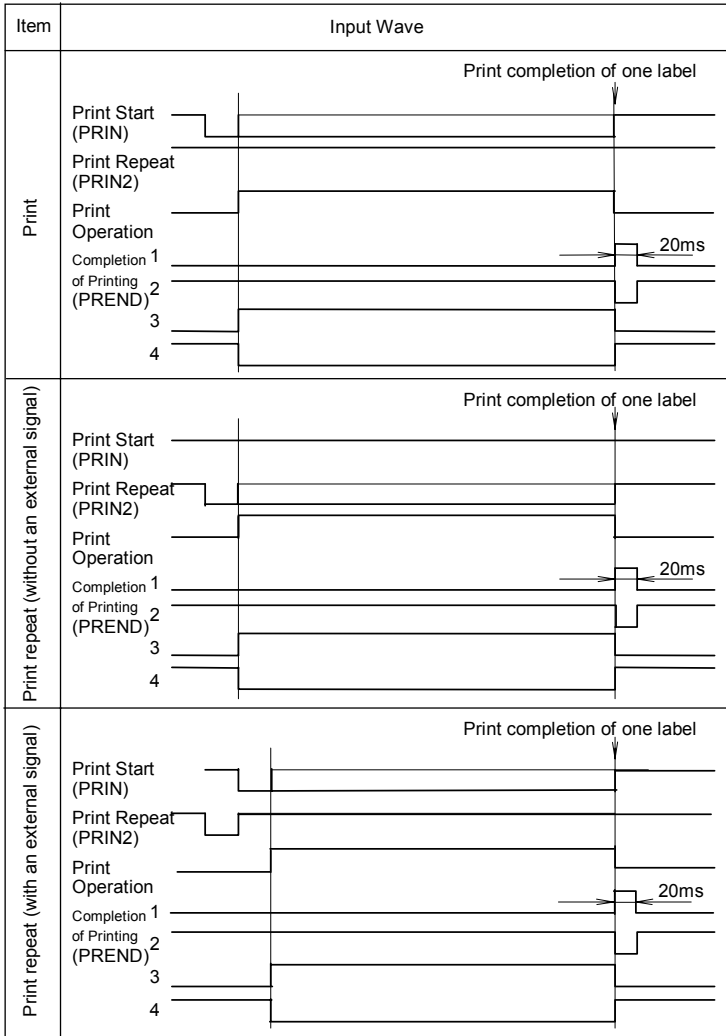
Note: **For the Print Start Signal (PRIN) and Print Repeat Signal (PRIN2), maintain the "High" level until the Print Completion Signal (PREND) is output. If the Print Start Signal and Print Repeat Signal are output at the same time, the Print Start Signal is effective and the Print Repeat Signal is not exe-**
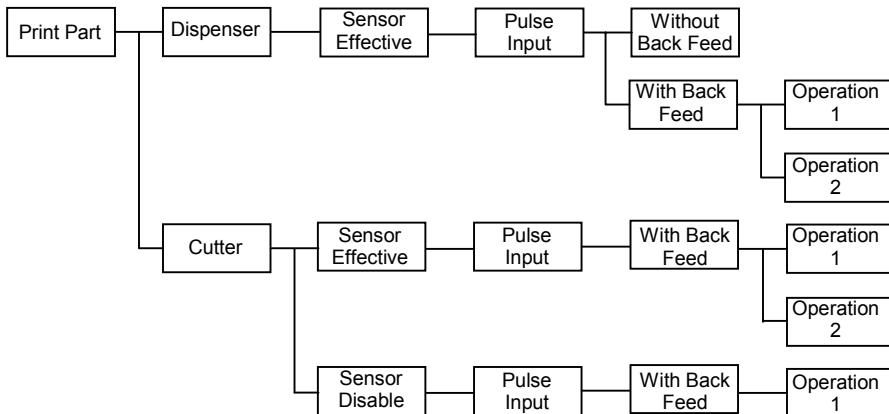
cuted.
The Print Repeat Signal is effective from the Print Operation Completion (QTY=0) to the next print data reception. The re-issue operation is not executed other than during this range.

2) Output Signal

Item	Output Wave
Machine Error	

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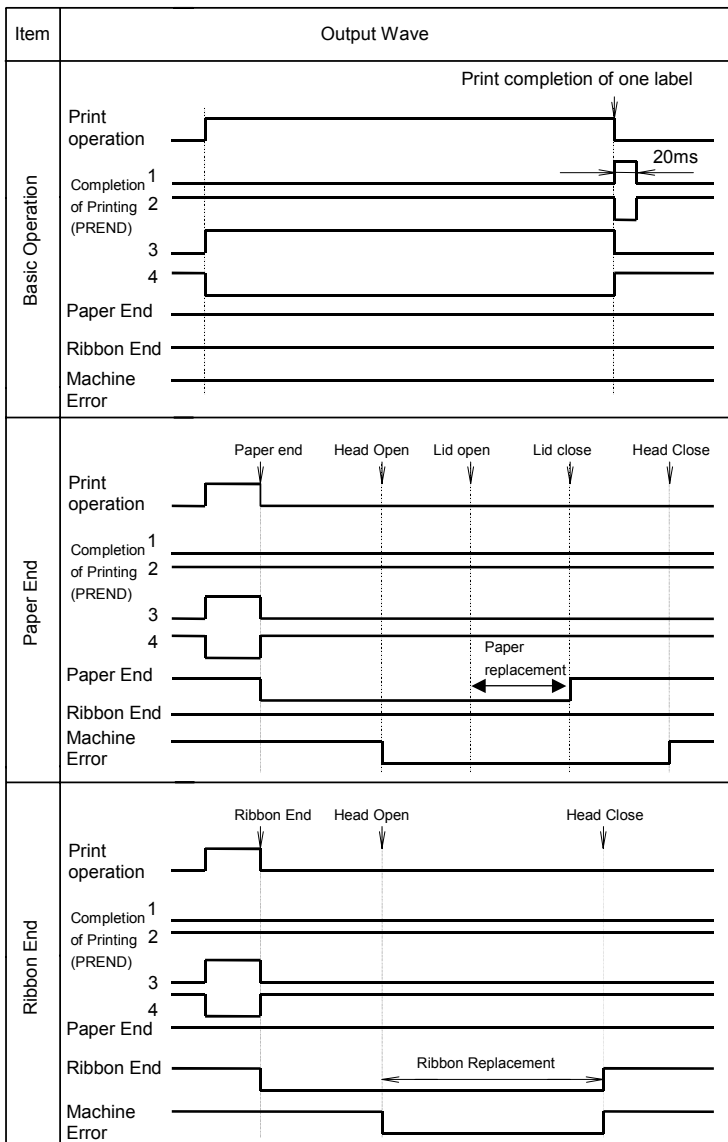
13.3   Operation Pulse

There are three types of dispenser pulse input for this printer as shown below. The next section describes the label process for each operation mode and its pulse waves.

```
Print Part ─┬─ Dispenser ── Sensor     ── Pulse   ─┬─ Without
            │              Effective      Input    │   Back Feed
            │                                       │
            │                                       └─ With Back ─┬─ Operation
            │                                          Feed       │   1
            │                                                     │
            │                                                     └─ Operation
            │                                                         2
            │
            └─ Cutter ─┬─ Sensor    ── Pulse   ── With Back ─┬─ Operation
                       │   Effective    Input      Feed      │   1
                       │                                     │
                       │                                     └─ Operation
                       │                                         2
                       │
                       └─ Sensor    ── Pulse   ── With Back ── Operation
                           Disable      Input      Feed         1
```

Operation 1: Back feed after printing

Operation 2: Print after back feeding

Item	Dispenser (Sensor Effective, Pulse Input, Back Feed: None)
Operation	
Pulse	
Other	In order to correct the label edge and the dispenser position, it is possible to avoid printing on the non-printable area of the label by using the length off-set.

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Item	Dispenser (Sensor Effective, Pulse Input, Back Feed: Valid and Operation 1)

Operation

Feed Direction

Position of Dispenser | Head | Length Sensor

Before Printing: ① ②

After printing one label: ① ② ③

Forward Feed Operation: ① ② ③

Back Feed Operation: ② ③

Pulse

External Signal (PRIN)

Print Operation

Forward Feed Operation

Back Feed Operation

External Signal (PREND)

500ms

Regular Operation

Other

The dispenser delay time is set to 0.5 second.

Item	Dispenser (Sensor Effective, Pulse Input, Back Feed: Valid and Operation 2)