

# CITIZEN

## Command Reference

MODEL : PMU3300

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**CITIZEN SYSTEMS JAPAN CO., LTD.**

## Revision history

Date	Version	Details of the changes
2020/8/12	1.01	First edition
2021/1/15	1.02	Detail explanation is added to MSW3-6
2021/3/11	1.03	Status data of "GS a" and "DLE DOT" are corrected.

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# 1. OUTLINE

## 1.1 Operation Mode

The control commands used on printers covered by this document are conformed to ESC/POS.

## 1.2 Character Set

All print data sent from the host computer to the printer are automatically converted to one-byte alphanumeric or katakana characters (ANK) or two-byte Kanji corresponding to the characters and symbols.

**NOTE:** For the contents of character set, refer to Character Code Table of this document.

## 1.3 Control Commands

### 1.3.1 Control Command Details

Control Commands are used for controlling the operations of the printer such as starting/stopping of printing, line feeding, paper feeding, etc. They control all functions related to printing, such as type of characters, enlargement of characters or setting of format.

### 1.3.2 How to Send Control Commands

Some methods are available for sending Control Commands from the host computer to the printer. Here, a method of sending by BASIC programming is explained.

#### Example 1

Let's print a character string "CITIZEN" in enlarged (double-height, double-width) and in normal format.

#### Program coding

The Control Command shows that the command name for setting the size of a character is GS!. Let's make a program using this code. An example is shown below.

Program List

```
10 A$="CITIZEN"  
20 LPRINT CHR$(&H1D);"!"; CHR$(&H11);  
30 LPRINT A$;  
40 LPRINT CHR$(&HA); CHR$(&HA);  
50 LPRINT CHR$(&H1D);"!"; CHR$(&H00);  
60 LPRINT A$;  
70 END
```

Print Result

```
CITIZEN  
  
CITIZEN
```

In lines 20 and 50, setting and canceling of enlarging a character is sent. As a result, lines 30 and 60 print the same character string but line 30 prints enlarged characters and line 60 cancels the enlargement and prints in normal format.

\* In this document, sample programs are in BASIC. For details of BASIC programming, refer to the manual for BASIC.

## 2. DETAIL

### 2.1 ESC/POS Command List

#### Print Control Commands

Command	Function	MODE	GSP	Page
<a href="#">LF</a>	Printing and paper feed	S·P		11
<a href="#">CR</a>	Back to printing	S·P		12
<a href="#">FF</a>	(1)Printing in PAGE MODE and returning to STANDARD MODE (at the selection of PAGE MODE) (2)Printing of Black mark/Label paper and feeding paper to the top of the print position (with Black mark/Label paper selected)	P		13
<a href="#">ESC FF</a>	Printing data in PAGE MODE	P		13
<a href="#">ESC J</a>	Printing and feeding paper in minimum pitch	S·P	○	14
<a href="#">ESC d</a>	Printing and feeding the paper by “n” lines	S·P		15

#### Print Character Commands

Command	Function	MODE	GSP	Page
<a href="#">CAN</a>	Canceling print data in PAGE MODE	P		16
<a href="#">ESC SP</a>	Setting the right spacing of the character	S·P	○	17
<a href="#">ESC !</a>	Collectively specifying the printing mode	S·P		18
<a href="#">ESC %</a>	Specifying/Canceling download character set	S·P		20
<a href="#">ESC &amp;</a>	Defining the download characters	S·P		21
<a href="#">ESC -</a>	Specifying/canceling underline	S·P		22
<a href="#">ESC ?</a>	Deleting download characters	S·P		23
<a href="#">ESC E</a>	Specifying/canceling emphasis printing	S·P		24
<a href="#">ESC G</a>	Specifying/canceling double strike printing	S·P		25
<a href="#">ESC M</a>	Selection of character fonts	S·P		26
<a href="#">ESC R</a>	Selecting the international character set	S·P		27
<a href="#">ESC V</a>	Specifying/canceling 90°-right-turned characters	S		28
<a href="#">ESC t</a>	Selecting the character code table	S·P		29
<a href="#">ESC {</a>	Specifying/canceling the inverted characters	S		30
<a href="#">GS !</a>	Specifying the character size	S·P		31
<a href="#">GS B</a>	Specifying/canceling the black/white inverted printing	S·P		144
<a href="#">GS b</a>	Specifying/canceling the smoothing	S·P		34

#### Print Position Commands

Command	Function	MODE	GSP	Page
<a href="#">HT</a>	Horizontal tab	S·P		35
<a href="#">ESC \$</a>	Specifying the absolute positions	S·P	○	36
<a href="#">ESC D</a>	Setting horizontal tab position	S·P		37
<a href="#">ESC T</a>	Selecting the character printing direction in PAGE MODE	P		38
<a href="#">ESC W</a>	Defining the print area in PAGE MODE	P	○	39
<a href="#">ESC \</a>	Specifying the relative position	S·P	○	41
<a href="#">ESC a</a>	Aligning the characters	S		42
<a href="#">GS \$</a>	Specifying the absolute vertical position of characters in PAGE MODE	P	○	43
<a href="#">GS L</a>	Setting the left margin	S	○	44
<a href="#">GS W</a>	Setting the print area width	S·P	○	45
<a href="#">GS \</a>	Specifying the relative vertical position of a character in PAGE MODE	P	○	47



### Line Feed Span Commands

Command	Function	MODE	GSP	Page
<a href="#">ESC 2</a>	Specifying initial line feed rate	S·P		48
<a href="#">ESC 3</a>	Setting line feed rate of minimum pitch	S·P	○	49

### Bit Image Commands

Command	Function	MODE	GSP	Page
<a href="#">ESC *</a>	Specifying the bit image mode	S·P		50
<a href="#">GS *</a>	Defining the download bit image	S·P		52
<a href="#">GS /</a>	Printing the downloaded bit image	S·P		53
<a href="#">GS v 0</a>	Printing of raster bit image	S		54

### Status Commands

Command	Function	MODE	GSP	Page
<a href="#">DLE EOT</a>	Sending status in real-time	S·P		56
<a href="#">ESC v</a>	Sending Printer status	S·P		59
<a href="#">GS a</a>	Enabling/disabling ASB (Automatic Status Back)	S·P		60
<a href="#">GS r</a>	Sending status	S·P		64

### Paper Detecting Commands

Command	Function	MODE	GSP	Page
<a href="#">ESC c 3</a>	Selecting the Paper Sensor valid for Paper-end signal output	S·P		66
<a href="#">ESC c 4</a>	Selecting the Paper Near-end Sensor valid for print stop	S·P		67

### Panel Switch Commands

Command	Function	MODE	GSP	Page
<a href="#">ESC c 5</a>	Enabling/disabling the panel switches	S·P		68

### Macro Commands

Command	Function	MODE	GSP	Page
<a href="#">GS :</a>	Starting/ending macro definition	S·P		69
<a href="#">GS ^</a>	Executing the macro	S·P		70

### Cutter Commands

Command	Function	MODE	GSP	Page
<a href="#">ESC j</a>	Full cut	S·P		71
<a href="#">ESC m</a>	Partial cut	S·P		72
<a href="#">GS V</a>	Cutting the paper	S·P	○	73

### Bar Code Commands

Command	Function	MODE	GSP	Page
<a href="#">GS H</a>	Selecting of printing position of HRI characters	S·P		74
<a href="#">GS f</a>	Selecting the font of HRI characters	S·P		75
<a href="#">GS h</a>	Specifying the height of the bar code	S·P		76
<a href="#">GS k</a>	Printing the bar code	S·P		77
<a href="#">GS w</a>	Specifying the horizontal size (magnification) of bar code	S·P		83

### Commands for Non-volatile Memory

Command	Function	MODE	GSP	Page
<a href="#">FS p</a>	Printing the download NV bit images	S		84

<a href="#">FS g</a>	Defining the download NV bit image	S		85
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### Kanji Control Commands

Command	Function	MODE	GSP	Page
<a href="#">FS !</a>	Collectively setting Kanji print mode	S·P		87
<a href="#">FS &amp;</a>	Setting Kanji mode	S·P		88
<a href="#">FS -</a>	Setting/Canceling Kanji underline	S·P		89
<a href="#">FS .</a>	Canceling Kanji mode	S·P		90
<a href="#">FS 2</a>	Defining external character	S·P		91
<a href="#">FS C</a>	Selecting Kanji code system	S·P		93
<a href="#">FS S</a>	Setting Kanji space amount	S·P	○	94
<a href="#">FS W</a>	Setting/Canceling four times enlargement of Kanji	S·P		95
<a href="#">FS (A</a>	Setting font attribute of Kanji	S·P		96

### Printer Function Setting Commands

Command	Function	MODE	GSP	Page
<a href="#">GS ( E</a>	Printer function setting command	S		97
<a href="#">GS ( K</a>	Selecting print control method	S		120
<a href="#">GS ( N</a>	Designating font attribute	S		エラー! ブックマ ークが 定義さ れてい ません。

### 2-dimensional Code Commands

Command	Function	MODE	GSP	Page
<a href="#">GS ( k</a>	Setting and printing 2-dimensional code	S·P		123

### Other Commands

Command	Function	MODE	GSP	Page
<a href="#">DLE ENQ</a>	Real-time request to printer	S·P		132
<a href="#">DLE DC4</a>	Buffer clear	S·P		134
<a href="#">ESC =</a>	Data input control	S·P		135
<a href="#">ESC @</a>	Initializing the printer	S·P		136
<a href="#">ESC L</a>	Selecting PAGE MODE	S		137
<a href="#">ESC S</a>	Selecting STANDARD MODE	P		138
<a href="#">GS ( A</a>	Execution of test printing	S		139
<a href="#">GS I</a>	Sending the printer ID	S·P		140
<a href="#">GS P</a>	Specifying the basic calculation pitch	S·P		142

In the Mode column: S = STANDARD MODE, P = PAGE MODE  
O = shows the command affected by GSP.

## 2.2 Command Details

### 2.2.1 Description of Items

XXXX

support model					
---------------	--	--	--	--	--

---

**[Function]** The name of a command.

**[Code]** The string of codes comprising the command is represented by <>H for hexadecimal numbers, <>B for binary numbers, and <> for decimal numbers, [ ] k denotes the number of repetition of "k" times.

**[Range]** Indicates the values (setting range) of arguments of the command.

**Note:** If values outside the defined domain specified with control codes are used, malfunctions could possibly occur, so be sure to use the values within the defined domain.

\*The defined domain may differ depending on the model or printer setting.

**[Outline]** Indicates command functions.

**[Caution]** Describes important points and cautionary notes, as required.

**[Default]** Initial values for the command if it has arguments.

**[See Also]** Describes commands related to the command when it is used.

**[Sample Program]**

Describes examples of coding on Quick-Basic.

\* Examples are only for reference. They may vary depending on language and version. For details, please refer to a manual in your language.

**[Print Results]**

Describes the print results obtained by executing the above programs. However, the print results shown are different in scale from actual print results

## 2.2.2 Print Control Commands

# LF

---

**[Function]**      Printing and paper feed

**[Code]**          <0A>H

**[Outline]**

- Prints data inside the print buffer and feeds paper based on the line feed amount having been set.

**[Caution]**

- After this command is executed, the beginning of the line is taken as the start position for the next point.

**[See Also]**      [ESC 2](#), [ESC 3](#)

**[Sample Program]**

```
LPRINT "AAA"; CHR$(&HA);  
LPRINT "BBB"; CHR$(&HA); CHR$(&HA);  
LPRINT "CCC"; CHR$(&HA);
```

**[Print Results]**

<b>AAA</b>	←	Print and line feed
<b>BBB</b>	←	Print and line feed
	←	Line feed only
<b>CCC</b>	←	Print and line feed

# CR

---

**[Function]** Back to printing

**[Code]** <0D>H

**[Outline]**

(1) MSW\* 1-5 OFF:

This command is ignored.

(2) MSW 1-5 ON:

The same operation as LF is executed.

\* Memory switch

**[See Also]** [LF](#)

**[Sample Program]**

```
LPRINT "AAA"; CHR$(&HD);  
LPRINT "BBB"; CHR$(&HD);  
LPRINT CHR$(&HD);  
LPRINT "CCC"; CHR$(&HD);
```

**[Print Results]**

In case of (2)

```
AAA ← Print and line feed  
BBB ← Print and line feed  
← Line feed only  
CCC ← Print and line feed
```

# FF (At selection of PAGE MODE)

---

<b>[Function]</b>	Printing in PAGE MODE and returning to STANDARD MODE (at the selection of PAGE MODE)
<b>[Code]</b>	<0C>H
<b>[Outline]</b>	<ul style="list-style-type: none"><li>• Executes a batch printout of the data mapped in the entire print area, and then returns to STANDARD MODE.</li></ul>
<b>[Caution]</b>	<ul style="list-style-type: none"><li>• All mapped data is erased after printout.</li><li>• The print area set up by ESC W is initialized.</li><li>• This command does not execute a paper cut.</li><li>• After this command is executed, the beginning of the line is taken as the start position for the next print.</li><li>• This command is only effective when the PAGE MODE is selected.</li></ul>
<b>[See Also]</b>	Appendix 5.1.4 "Example of Using PAGE MODE" <a href="#">ESC FF</a> , <a href="#">ESCL</a> , <a href="#">ESC S</a>

# ESC FF

---

<b>[Function]</b>	Printing data in PAGE MODE
<b>[Code]</b>	<1B>H<0C>H
<b>[Outline]</b>	<ul style="list-style-type: none"><li>• Executes a batch printout of the data mapped in the entire print area in PAGE MODE.</li></ul>
<b>[Caution]</b>	<ul style="list-style-type: none"><li>• This command is only effective when PAGE MODE is selected.</li><li>• Mapped data, as well as the ESC T and ESC W settings, and the character mapping position are held even after printing.</li></ul>
<b>[See Also]</b>	Appendix 5.1 "Explanation on PAGE MODE" <a href="#">FF</a> , <a href="#">ESCL</a> , <a href="#">ESC S</a>

# ESC J n

---

<b>[Function]</b>	Printing and feeding paper in minimum pitch
<b>[Code]</b>	<1B>H<4A>H<n>
<b>[Range]</b>	0≤n≤255
<b>[Outline]</b>	<ul style="list-style-type: none"><li>• Prints the data held in the print buffer and feeds paper by [n×basic calculation pitch] inches.</li></ul>
<b>[Caution]</b>	<ul style="list-style-type: none"><li>• After this command is executed, the beginning of the line is taken as the start position for the next print.</li><li>• The line feed width can be set separately for the STANDARD and PAGE MODES.</li><li>• This command does not affect the line feed width defined by ESC 2 or ESC 3.</li><li>• The basic calculation pitch is set by GS P.</li><li>• Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.</li><li>• In STANDARD MODE, this command uses the vertical (paper feed direction) basic calculation pitch (y).</li><li>• In PAGE MODE, this command acts differently depending on the start point:<ul style="list-style-type: none"><li>(1) If the start point specified by ESC T is top left or bottom right, the command uses the vertical (Paper feed direction) basic calculation pitch (y).</li><li>(2) If the start point specified by ESC T is top right or bottom left, the command uses the horizontal (Perpendicular to the paper feed direction) basic calculation pitch (x).</li></ul></li><li>• The maximum settable line feed width is 1016 mm (40 inches). A setting greater than this maximum is trimmed to the maximum.</li></ul>
<b>[Default]</b>	The initial value is not defined.

# ESC d n

---

**[Function]** Printing and feeding the paper by “n” lines

**[Code]** <1B>H<64>H<n>

**[Range]** 0≤n≤255

**[Outline]**

Prints data in the print buffer and feeds paper by “n” lines. Specified lines do not remain.

**[Caution]**

- After this command is executed, the beginning of the line is taken as the start position for the next print.
- If [n×line feed width] exceeds approximately 1016 mm, this command feeds paper by approximately 1016 mm (40 inches).

**[Default]**

The initial value is not defined.

**[Sample Program]**

```
LPRINT "AAAAA";  
LPRINT CHR$(&H1B);"d";CHR$(2);  
LPRINT "AAAAA";CHR$(&HA);
```

**[Print Results]**

```
AAAAA  
      |  
      | 2/6-inch line feed  
      |  
AAAAA
```



## 2.2.3 Print Character Commands

# CAN

---

**[Function]** Canceling print data in PAGE MODE

**[Code]** <18>H

**[Outline]** Erases all data contained in the currently effective print area in PAGE MODE.

**[Caution]**

- This command is only effective when PAGE MODE is selected.
- If the previously established print area overlaps the currently effective print area, the overlapped data in the previously established area will be erased.

**[See Also]** Appendix 5.1 "Explanation on PAGE MODE"  
[ESCL](#), [ESC W](#)

# ESC SP n

**[Function]** Setting the right spacing of the character

**[Code]** <1B>H<20>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- Sets the right spacing of character to [n×basic calculation pitch] inches.

**[Caution]**

- If the horizontal magnification of character is 2 or more, the right spacing increases with the magnification.
- Does not affect Kanji.
- The right spacing can be set separately for the STANDARD and PAGE MODES.
- The basic calculation pitch is set by GS P. Once defined, the right spacing is not changed if the basic calculation pitch is changed by GS P.
- Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- In STANDARD MODE, this command uses the horizontal basic calculation pitch (x).
- In PAGE MODE, the basic calculation pitch used by this command depends on the start point
  - (1) If the start point specified by ESC T is top left or bottom right, the command uses the horizontal basic calculation pitch (x).
  - (2) If the start point specified by ESC T is top right or bottom left, the command uses the vertical basic calculation pitch (y).
- The maximum right spacing is capable of approximately 31.906 mm (255/203 inches). A setting greater than this maximum is trimmed to the maximum.

**[Default]** n=0

**[See Also]** [GSP](#)

**[Sample Program]**

```
LPRINT CHR$(&H1B);" "; CHR$(0);  
LPRINT "AAAAA"; CHR$(&HA);  
LPRINT CHR$(&H1B);" "; CHR$(1);  
LPRINT "AAAAA"; CHR$(&HA);  
LPRINT CHR$(&H1B);" "; CHR$(12);  
LPRINT "AAAAA"; CHR$(&HA);
```

**[Print Results]**

```
A A A A A      ← 0-dot space  
A A A A A      ← 1-dot space  
A A A A A      ← 12-dots space
```

# ESC ! n

---

**[Function]** Collectively specifying the printing mode

**[Code]** <1B>H<21>H<n>

**[Range]** 0≤n≤255

**[Outline]** Printing mode is assigned.

Bit	Function	Value	
		0	1
0	Character Font	Font A (12×24)	Font B (9×17)
1	Undefined	—	—
2	Undefined	—	—
3	Emphasis	Canceled	Specified
4	Double height	Canceled	Specified
5	Double width	Canceled	Specified
6	Undefined	—	—
7	Underline	Canceled	Specified

**[Caution]**

- With double height and double width being specified simultaneously, quadruple characters are created.
- An underline is attached to the full character width, which, however, is not attached to the part having been skipped by the horizontal tab (HT). Neither is it attached to 90°-right-turned characters.
- The underline width is as specified by the ESC – command. (The default setting is 1 dot width.)
- Setting by this command is invalid for Kanji except setting and canceling of enhanced printing.
- In case characters with different vertical magnification ratios coexist on the same line, they are printed on the same base line.
- ESC E, ESC M, ESC –, and GS ! can individually set or cancel the mode but the command processed last is valid.
- Setting or canceling of enhanced 3rd bit is valid for alphanumeric and kana and kanji. Other print mode is valid only for alphanumeric and kana characters.
- Setting memory SW 3-7 to ON allows the horizontal and vertical relations to be interchanged when 90°-right-turning of character is specified.

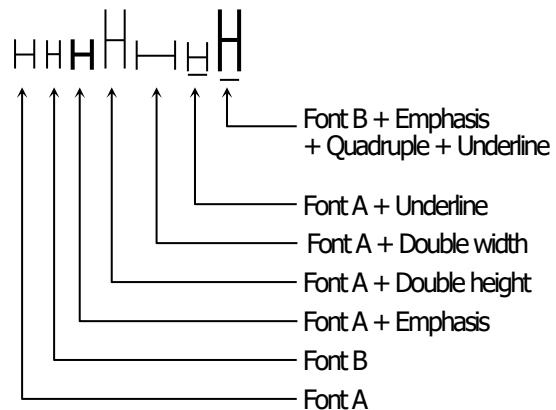
**[Default]** n=0

**[See Also]** [ESCE](#), [ESC-](#), [GS!](#)

**[Sample Program]**

```
LPRINT CHR$(&H1B);"!"; CHR$(&H00);"H";  
LPRINT CHR$(&H1B);"!"; CHR$(&H01);"H";  
LPRINT CHR$(&H1B);"!"; CHR$(&H08);"H";  
LPRINT CHR$(&H1B);"!"; CHR$(&H10);"H";  
LPRINT CHR$(&H1B);"!"; CHR$(&H20);"H";  
LPRINT CHR$(&H1B);"!"; CHR$(&H80);"H";  
LPRINT CHR$(&H1B);"!"; CHR$(&HB9);"H";  
LPRINT CHR$(&HA);
```

**[Print Results]**



# ESC % n

**[Function]** Specifying/canceling download character set

**[Code]** <1B>H<25>H<n>

**[Range]** 0≤n≤255

**[Outline]**

Specifying/canceling download characters.

- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	Canceling download character set
1	Specifying download character set

**[Default]** n=0

**[See Also]** [ESC &](#)

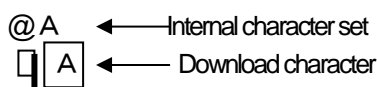
**[Sample Program]**

```

GOSUB SETCHR                                DATA 6
LPRINT CHR$(&H1B);"%";CHR$(0);             DATA &HFF,&H80,&H00
LPRINT "@A";CHR$(&HA);                      DATA &H80,&H80,&H00
LPRINT CHR$(&H1B);"%";CHR$(1);             DATA &H80,&H80,&H00
LPRINT "@A";CHR$(&HA);                      DATA &H80,&H80,&H00
END                                           DATA &HFF,&HFF,&HFF
SETCHR:                                       DATA &HFF,&HFF,&HFF
LPRINT CHR$(&H1B);"&";                       DATA 12
LPRINT CHR$(3);"@";"A";                    DATA &HFF,&HFF,&HFF
FOR J=1 TO 2                                  DATA &H80,&H07,&HF9
  READ REP                                    DATA &H80,&HFF,&HF9
  LPRINT CHR$(REP);                          DATA &H87,&HFE,&H01
  FOR I=1 TO REP*3                            DATA &H9F,&H06,&H01
    READ D                                    DATA &HF8,&H06,&H01
    LPRINT CHR$(D);                          DATA &HF8,&H06,&H01
  NEXT I                                       DATA &H9F,&H06,&H01
NEXT J                                        DATA &H87,&HFE,&H01
RETURN                                       DATA &H80,&HFF,&HF9
                                           DATA &H80,&H07,&HF9
                                           DATA &HFF,&HFF,&HFF

```

**[Print Results]**



# ESC & s n m [ a [ p ] s x a ] m-n+1

**[Function]** Defining the download characters

**[Code]** <1B>H<26>H<s>H<n>H<m>H [<a>H<p1>H<p2>...<ps>a] m-n+1

**[Range]** s=3(Font A, B), s=2(Font C)  
 32≤n≤m≤126  
 0≤a≤12(Font A)  
 0≤a≤9 (Font B)  
 0≤a≤8 (Font C)  
 0≤p1–ps≤255

**[Outline]**

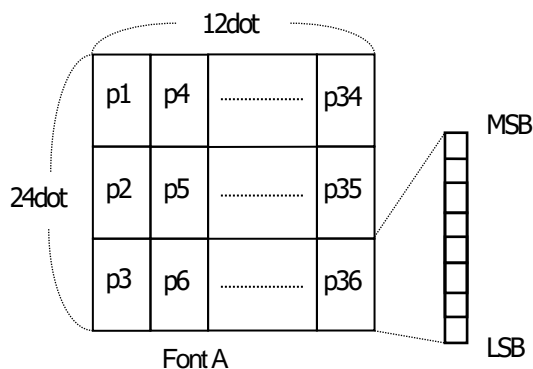
- Defines the font of download characters of alphanumeric characters.
- “s” indicates the number of bytes in vertical direction.
- “n” indicates the start character code and “m” the end character code. To define only one character, set n = m.
- Character codes definable includes 95 ASCII codes in total in the range of 20H to 7EH.
- “a” indicates the number of dots to be defined in horizontal direction.
- “p” is the data to be defined, which indicate a pattern equal to “a” dots in horizontal direction from the left end. The rest of the pattern on the right side is filled with space.
- The number of data to be defined is “s × a”.
- Download characters thus defined remain valid until redefinition, execution of ESC @, GS \*, FS q, GS (A, deletion by ESC ?, or power OFF is performed.

**[Caution]** • Running this command clears the definition of the download bit image.

**[Default]** Same as the internal character set.

**[See Also]** [ESC %](#), [ESC ?](#)

**[Example]**



Create each data bit by setting “1” for a printed dot and “0” for an unprinted dot.

**[Sample Program]**

[Refer to Sample Program and Print Results for ESC %.](#)

# ESC - n

**[Function]** Specifying /canceling underline

**[Code]** <1B>H<2D>H<n>

**[Range]** 0≤n≤2, 48≤n≤50

**[Outline]**

- Specifying /canceling an underline.

n	Function
0,48	Canceling underline
1,49	Setting 1-dot width underline
2,50	Setting 2-dot width underline

**[Caution]**

- An underline is attached to the full character width. It is, however, not attached to the part having been skipped by horizontal tab (HT) command.
- An underline is not attached to 90°-right-turned characters and white-on-black character.
- Underline can also be specified/canceled by ESC ! but the setting of command last processed is valid.
- Specifying/canceling by this command is not valid for kanji.
- Underline width is constant in the specified thickness regardless of the character size.

**[Default]** n=0

**[See Also]** [ESC !](#), [FS -](#)

**[Sample Program]**

```
LPRINT CHR$(&H1B);"-"; CHR$(0);  
LPRINT "AAAAA";  
LPRINT CHR$(&H1B);"-"; CHR$(1);  
LPRINT "AAAAA"; CHR$(&HA);
```

**[Print Results]**

Underline canceled  
←→  
A A A A A A A A  
←→  
Underline specified

# ESC ? n

---

**[Function]** Deleting download characters

**[Code]** <1B>H<3F>H<n>

**[Range]**  $32 \leq n \leq 126$

**[Outline]**  
Deletes the downloaded characters of specified code.

**[Caution]**

- The character “n” indicates the character code used to delete the defined pattern. After the deletion, characters are printed in the same pattern as the internal characters.
- This command deletes the code-defined pattern of the character font selected by ESC !.
- This command is ignored if the specified character code is undefined.

**[See Also]** [ESC &](#), [ESC %](#)



# ESC E n

---

**[Function]** Specifying/canceling emphasis printing

**[Code]** <1B>H<45>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- Specifying/canceling the emphasized characters.
- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	Canceling emphasis printing
1	Specifying emphasis printing

**[Caution]**

- Emphasis printing can also be specified/canceled by ESC ! but the setting of command last processed is valid.
- Valid for all character types except HRI characters.

**[Default]** n=0

**[See Also]** [ESC!](#)

**[Sample Program]**

```
LPRINT CHR$(&H1B);"E"; CHR$(0);  
LPRINT "AAABBB"; CHR$(&HA);  
LPRINT CHR$(&H1B);"E"; CHR$(1);  
LPRINT "AAABBB"; CHR$(&HA);
```

**[Print Results]**

```
AAABBB ← Emphasis canceled  
AAABBB ← Emphasis specified
```

# ESC G n

---

**[Function]** Specifying/canceling double strike printing

**[Code]** <1B>H<47>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- Specifying /canceling the double strike printing.
- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	Canceling double strike printing
1	Specifying double strike printing

**[Caution]**

- With this printer, double-strike printing and emphasis printing provide completely the same results.
- Valid for all character types except HRI characters.

**[Default]** n=0

**[See Also]** [ESCE](#)

**[Sample Program]**

```
LPRINT CHR$(&H1B);"G"; CHR$(0);  
LPRINT "AAABBB"; CHR$(&HA);  
LPRINT CHR$(&H1B);"G"; CHR$(1);  
LPRINT "AAABBB"; CHR$(&HA);
```

**[Print Results]**

```
AAABBB ← Double strike printing canceled  
AAABBB ← Double strike printing specified
```

# ESC M n

---

**[Function]** Selection of character fonts

**[Code]** <1B>H<4D>H<n>

**[Range]**  $0 \leq n \leq 2$ ,  $48 \leq n \leq 50$

**[Outline]**

- Selects character fonts.

n	Function
0, 48	Selection of font A (12 × 24)
1, 49	Selection of font B (9 × 17)
2, 50	Selection of font C (8 × 16)

**[Caution]** • ESC ! can also select fonts, but the setting made by the command that has last been processed becomes valid.

**[Default]** n=0

**[See Also]** [ESC!](#)

# ESC R n

---

**[Function]** Selecting the international character set

**[Code]** <1B>H<52>H<n>

**[Range]**  
 $0 \leq n \leq 16$

**[Outline]**

- Depending on the value of “n”, one of the following character sets is specified;

n	Character Set	n	Character Set
0	U.S.A.	9	Norway
1	France	10	Denmark II
2	Germany	11	Spain II
3	U.K.	12	Latin America
4	Denmark I	13	Korea
5	Sweden	14	Croatia
6	Italy	15	China
7	Spain I	16	Vietnam
8	Japan		

**[Default]**  
n=0 (International), n=8 (Japan)

n follows the setting of MSW9-2.

**[See Also]** [3.2 “International Character Code Table”](#)

# ESC V n

**[Function]** Specifying/canceling 90°-right-turned characters

**[Code]** <1B>H<56>H<n>

**[Range]** 0≤n≤1, 48≤n≤49

**[Outline]**

- Specifying/canceling 90°-right-turned characters.

n	Function
0,48	Canceling 90°-right-turned characters
1,49	Specifying 90°-right-turned characters

**[Caution]**

- No underlines are attached to 90°-right-turned characters.
- This command does not affect PAGE MODE but setting is maintained.

**[Default]** n=0

**[Sample Program]**

```
LPRINT CHR$(&H1B);"V"; CHR$(0);  
LPRINT "AAAAA";  
LPRINT CHR$(&H1B);"V"; CHR$(1);  
LPRINT "AAAAA"; CHR$(&HA);
```

**[Print Results]**

←→  
A A A A A ▷▷▷▷▷  
90° rotation canceled ←→ 90° rotation specified

# ESC t n

**[Function]** Selecting the character code table

**[Code]** <1B>H<74>H<n>

**[Range]** 0≤n≤9, 16≤n≤19, n=26, 40, 255

**[Outline]**

- Selecting the character code table.
- The character code table is selected based on the value of “n”.

n	Character Code Table	n	Character Code Table
0	Codepage PC437	19	Codepage PC858
1	Katakana	20	Thai code11 1 Pass
2	Codepage PC850	21	Thai code11 3 Pass
3	Codepage PC860	25	Thai code 18 1 Pass
4	Codepage PC863	26	Thai code 18 3 Pass
5	Codepage PC865	30	TCVN3
6,18	Codepage PC852	31	TCVN3 Caps
7,17	Codepage PC866	40	Codepage PC864
8	Codepage PC857	52	WPC12584
9,16	WPC1252	255	Space page (For user setting)

**[Default]**

n follows the setting of MSW9-1.

**[Sample Program]**

```
LPRINT CHR$(&H1B);"t"; CHR$(0);
LPRINT "n=0 ";
FOR C=&HB1 TO &HB5
  LPRINT CHR$(C);
NEXT C
LPRINT CHR$(&HA);
LPRINT CHR$(&H1B);"t"; CHR$(1);
LPRINT "n=1 ";
FOR C=&HB1 TO &HB5
  LPRINT CHR$(C);
NEXT C
LPRINT CHR$(&HA);
```

**[Print Results]**

```
n=0  ㄐ  |  ㄐ
n=1  アイエオ
```

# ESC { n

**[Function]** Specifying/canceling the inverted characters

**[Code]** <1B>H<7B>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- “n” is valid only for the lowest bit (n0).
- Rotate data in the line by 180 degrees and print it.
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	Canceling inverted characters.
1	Specifying inverted characters.

**[Caution]**

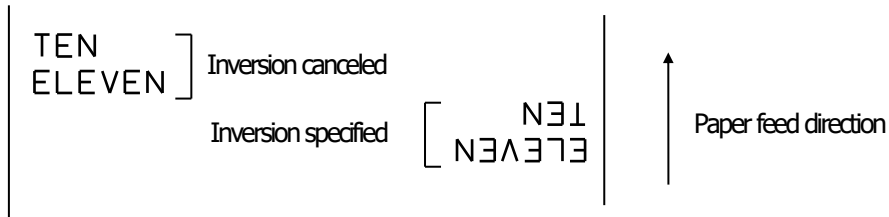
- This command is valid only when it is specified at the beginning of a line.
- This command does not affect the PAGE MODE.

**[Default]** n=0

**[Sample Program]**

```
LPRINT CHR$(&H1B);"{"; CHR$(0);
LPRINT "TEN"; CHR$(&HA);
LPRINT "ELEVEN"; CHR$(&HA);
LPRINT CHR$(&H1B);"{"; CHR$(1);
LPRINT "TEN"; CHR$(&HA);
LPRINT "ELEVEN"; CHR$(&HA);
```

**[Print Results]**



# GS ! n

**[Function]** Specifying the character size

**[Code]** <1D>H<21>H<n>

**[Range]**  $0 \leq n \leq 255$   
Where:  $1 \leq \text{vertical magnification} \leq 8$ ,  $1 \leq \text{horizontal magnification} \leq 8$

**[Outline]**

- Specifies the character size (Vertical and horizontal magnification).

Bit	Function	Value	
		Hex. Number	Decimal Number
0	Vertical magnification specification	Refer to Table 2, "Vertical Magnification".	
1			
2			
3			
4	Horizontal magnification specification	Refer to Table 1, "Horizontal Magnification".	
5			
6			
7			

**Table 1 Horizontal Magnification**

Hex.	Decimal	Magnification
00H	0	1 × (Standard)
10H	16	2 × (Double width)
20H	32	3 ×
30H	48	4 ×
40H	64	5 ×
50H	80	6 ×
60H	96	7 ×
70H	112	8 ×

**Table 2 Vertical Magnification**

Hex.	Decimal	Magnification
00H	0	1 × (Standard)
01H	1	2 × (Double)
02H	2	3 ×
03H	3	4 ×
04H	4	5 ×
05H	5	6 ×
06H	6	7 ×
07H	7	8 ×



**[Caution]**

- This command is valid for all characters (alphanumeric, kana, and kanji) except for HRI characters.
- This command is ignored if either the vertical magnification or horizontal magnification is out of the defined range.
- In PAGE MODE, the vertical direction means the top-bottom direction of each character. The horizontal direction means the side-to-side direction of each character. If characters of different vertical magnification are contained in a line, the baseline of each character is lined up.
- Horizontal and vertical magnification can also be specified/canceled by ESC ! but the setting of command last processed is valid.
- In STANDARD MODE, the vertical direction is defined as the paper feed direction, and the horizontal direction is defined as the direction perpendicular to the paper feed.
- Setting memory SW 3-7 to ON allows the horizontal and vertical relations to be interchanged when 90°-right-turning of character is specified.

**[Default]**

n=0

**[See Also]**

[ESC!](#)

# GS B n

---

**[Function]** Specifying/canceling the black/white inverted printing

**[Code]** <1D>H<42>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- This command specifies or cancels the black/white inverted printing.
- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	The black/white inverted printing is canceled.
1	The black/white inverted printing is specified.

**[Caution]**

- The black/white inversion works on internal and downloaded characters.
- The black/white inversion works also on the right spacing of characters defined by ESC SP.
- This command does not affect the bit image, downloaded bit image, bar code, HRI characters, or the skip area specified by HT, ESC \$, or ESC \.
- This command does not affect the space between lines.
- Black/white inversion specification takes precedence over underline specification. Underline printing specified is, therefore, nullified if black/white inversion is specified; the underline setting, however, remains unchanged.

**[Default]** n=0

# GS b n

---

**[Function]** Specifying/canceling the smoothing

**[Code]** <1D>H<62>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- This command specifies or cancels the smoothing.
- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	The smoothing is canceled.
1	The smoothing is specified.

**[Caution]**

- Smoothing is effective to printer's internal characters, download characters, and non-standard characters.
- Smoothing is not effective to characters with either of their vertical or horizontal magnification is x1.

**[Default]** n=0

**[See Also]** [ESC!](#) , [GS!](#)

## 2.2.4 Print Position Commands

# HT

---

**[Function]** Horizontal tab

**[Code]** <09>H

**[Outline]**

- Shifts the printing position to the next horizontal tab position.
- Ignored when the next horizontal tab position has not been set.

**[Caution]**

- The horizontal tab position is set by ESC D.

**[Default]**

At the selection of font A, tabs are set every 8 characters (at 9th, 17th, 25th, ...) with right space amount of a character set at 0 and horizontal enlargement rate of a character set at 1.

**[See Also]** [ESC D](#)

**[Sample Program]**

```
LPRINT "012345678901234567890"; CHR$(&HA);  
LPRINT CHR$(&H9);"AAA";  
LPRINT CHR$(&H9);"BBB"; CHR$(&HA);  
LPRINT CHR$(&H1B);"D";  
LPRINT CHR$(3); CHR$(7); CHR$(14); CHR$(0);  
LPRINT CHR$(&H9);"AAA";  
LPRINT CHR$(&H9);"BBB";  
LPRINT CHR$(&H9);"CCC"; CHR$(&HA);
```

**[Printing Result]**

```
012345678901234567890  
      AAA   BBB  
AAA BBB   CCC
```

← Initially set horizontal tab

← When set to the 4th, 8th, and 15th columns

# ESC \$ n1 n2

**[Function]** Specifying the absolute positions

**[Code]** <1B>H<24>H<n1><n2>

**[Range]**  $0 \leq n1 \leq 255$   
 $0 \leq n2 \leq 255$

**[Outline]**

- The printing start position is specified by the absolute position from the left margin with the number of dots divided by 256 and quotient specified as "n2" and remainder as "n1". Therefore, the printing start position is designated as  $n1+n2 \times 256 \times \text{basic calculation pitch}$  from the left margin.

**[Caution]**

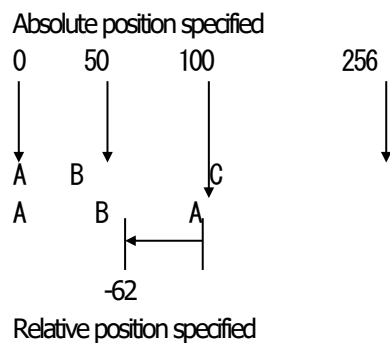
- The basic calculation pitch is set by GS P. After the line feed width is set, if the basic calculation by GS P leaves a fraction, the fraction is corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- In STANDARD MODE, this command uses the horizontal (Paper feed direction) basic calculation pitch (x).
- In PAGE MODE, this command acts differently depending on the start point:
  - (1) If the start point specified by ESC T is top right or bottom left, the command uses the vertical (Paper feed direction) basic calculation pitch (y).
  - (2) If the start point specified by ESC T is top left or bottom right, the command uses the horizontal (Perpendicular to the paper feed direction) basic calculation pitch (x). Specification beyond the end of the line is ignored.

**[See Also]** [ESC \ GS P, GS \, GS \\$](#)

**[Sample Program]**

```
LPRINT CHR$(&H1B);"$";
LPRINT CHR$(0); CHR$(0);"A";
LPRINT CHR$(&H1B);"$";
LPRINT CHR$(50); CHR$(0);"B";
LPRINT CHR$(&H1B);"$";
LPRINT CHR$(0); CHR$(1);"C"; CHR$(&HA);
LPRINT CHR$(&H1B);"$";
LPRINT CHR$(100); CHR$(0);"A";
LPRINT CHR$(&H1B);"I";
LPRINT CHR$(&HC2); CHR$(&HFF);"B"; CHR$(&HA);
```

**[Print Results]**



# ESC D [n] k NULL

---

**[Function]** Setting horizontal tab position

**[Code]** <1B>H<44>H [<n>] k<00>H

**[Range]**  $1 \leq n \leq 255$   
 $0 \leq k \leq 32$

**[Outline]**

- Specifying a horizontal tab position.
- “n” indicates the number of columns from the beginning to the horizontal tab position. Note, however, that “n = set position – 1”. For example, to set the position at 9th column, n = 8 is to be specified.
- “k” denotes the number of horizontal tab positions you want to set.
- The tab position is set at a position where it is “character width×n” from the beginning of a line. The character width, at this time, includes the space on the right. In double width characters, it is made double the ordinary case.
- Tab positions that can be specified are maximum 32. Specifying tab positions exceeding this limit is ignored.
- <n> k, which denotes a setting position, is input in the increasing order and ends at 00H.
- ESC D <NULL> clears all the set tab positions. Following clearing, the horizontal tab command is ignored.

**[Caution]**

- When the data, <n> k, is equal to or smaller than its preceding data, <n> k-1, it is assumed that tab setting is finished. If this is the case, the next data onward will be processed as normal data.
- When the data, <n> k, exceeds a 1-line print area, set the horizontal tab position, as “Set column position = Maximum print columns + 1”.
- The horizontal tab position does not change even if the character width is altered after setting the horizontal tab position.

**[Default]** At the selection of font A, tabs are set every 8 characters (at 9th, 17th, 25th, ...) with right space amount of a character set at 0 and horizontal enlargement rate of a character set at 1.

**[See Also]** [HT](#)

**[Sample Program]**

[Refer to Sample Program and Print Results for HT.](#)

# ESC T n

**[Function]** Selecting the character printing direction in PAGE MODE

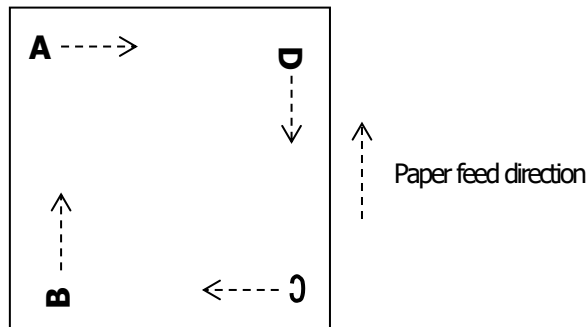
**[Code]** <1B>H<54>H<n>

**[Range]** 0≤n≤3, 48≤n≤51

**[Outline]**

- Selects the direction and start point of character printing in PAGE MODE.

n	Printing Direction	Start Point
0, 48	Left to right	Top left ("A" in the figure)
1, 49	Bottom to top	Bottom left ("B" in the figure)
2, 50	Right to left	Bottom right ("C" in the figure)
3, 51	Top to bottom	Top right ("D" in the figure)



**[Caution]**

- When STANDARD MODE is selected, this command only executes the internal flagging of the printer without affecting the printing in STANDARD MODE.
- The character mapping position will be the start point of the print area specified by ESC W.
- The basic calculation pitch (x or y) used by the following commands varies with the start point.
  - (1) If the start point is the top left or bottom right (The characters are mapped in the direction perpendicular to the paper feed),
    - Commands using x: ESC SP, ESC S, ESC \
    - Commands using y: ESC 3, ESC J, GS \$, GS \
  - (2) If the start point is the top right or bottom left (The characters are mapped in the paper feed direction),
    - Commands using x: ESC 3, ESC J, GS \$, GS \
    - Commands using y: ESC SP, ESC S, ESC \

**[Default]** n=0

**[See Also]** [Appendix 5.1 "Explanation on PAGE MODE"](#)  
[ESC \\$](#), [ESCL](#), [ESC W](#), [ESC \](#), [GS \\$](#), [GSP](#), [GS \](#)

# ESC W xL xH yL yH dxL dxH dyL dyH

**[Function]** Defining the print area in PAGE MODE

**[Code]** <1B>H<57>H<xL><xH><yL><yH><dxL><dxH><dyL><dyH>

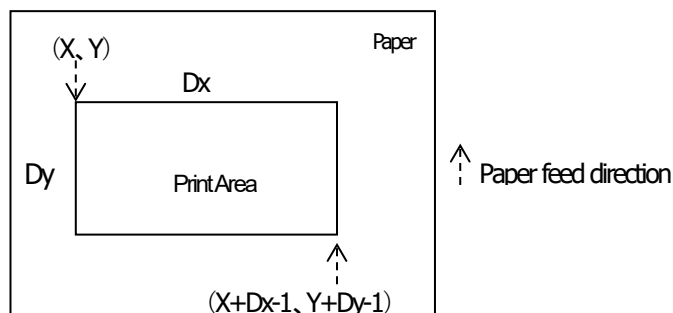
**[Range]**  $0 \leq xL, xH, yL, yH, dxL, dxH, dyL, dyH \leq 255$   
except for  $dxL=dxH=0$  or  $dyL=dyH=0$

**[Outline]**

- Defines the location and size of the print area.
- Horizontal start point =  $[(xL+xH \times 256) \times \text{basic calculation pitch}(x)]$  inches
- Vertical start point =  $[(yL+yH \times 256) \times \text{basic calculation pitch}(y)]$  inches
- Horizontal length =  $[(dxL+dxH \times 256) \times \text{basic calculation pitch}(x)]$  inches
- Vertical length =  $[(dyL+dyH \times 256) \times \text{basic calculation pitch}(y)]$  inches

**[Caution]**

- When STANDARD MODE is selected, this command only executes the internal flagging of the printer without affecting the printing in STANDARD MODE.
- If the horizontal start point or vertical start point is out of the printable area, this command is canceled and the next data is handled as normal data.
- If the horizontal length or vertical length is 0, this command is canceled and the next data is handled as normal data.
- The character mapping position will be the start point specified by ESC T in the print area.
- If the "horizontal start point + horizontal length" is greater than the horizontal printable area, the "horizontal printable area – horizontal start point" is taken as the horizontal length.
- If the "vertical start point + vertical length" is greater than the vertical printable area, the "vertical printable area – vertical start point" is taken as the vertical length.
- The basic calculation pitch is defined by GS P. Once defined, the print area is not changed if the basic calculation pitch is changed by GS P.
- Fractions resulting from calculations are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- The horizontal start point and horizontal length are calculated with the basic calculation pitch (x). The vertical start point and vertical length are calculated with the basic calculation pitch (y).
- The figure below illustrates the print area, where X = horizontal start point, Y = vertical start point, Dx = horizontal length, and Dy = vertical length.





- The maximum horizontal length that can the printing width. (Refer to the below Table)
- The maximum setting length in the vertical direction is as follows  
About 117mm (928 dot / 203inch)

**[Default]**

$xL=xH=yL=yH=0$

$dyL=126, dyH=6$  (In the case of basic calculation pitch (y) = 360: Vertical direction length = about 117mm)

(In the case of basic calculation pitch(y) = 406: Vertical direction length = about 103 mm)

$dxL, dxH$  depends on paper width. (Refer to the below Table)

paper width	print width(dot)	dxL	dxH	support model
80mm	72mm(576)	64	2	<b>PMU3300</b>
58mm	51mm(408)	152	1	<b>PMU3300</b>
58mm	48mm(384)	128	1	<b>PMU3300</b>

\*  $dxL$  and  $dxH$  is the case of basic calculation pitch (x) =203.

**[See Also]**

[Appendix 5.1 "Explanation on PAGE MODE"](#)  
[CAN](#), [ESCL](#), [ESC.T](#), [GSP](#)

# ESC \ nL nH

---

**[Function]** Specifying the relative position

**[Code]** <1B>H<5C>H<nL><nH>

**[Range]**  $0 \leq nL \leq 255$   
 $0 \leq nH \leq 255$

**[Outline]**

- This command specifies the next print start position in a relative position with respect to the current position.
- The next print start position will be at a point of  $[(nL+nH \times 256) \times \text{basic calculation pitch}]$  inches away from the current position.

**[Caution]**

- Specification of a position outside the print area is ignored.
- If a new position is specified to the right of the current position in the direction of printing, it should be specified as positive (+). If it is to the left, it should be as negative (-).
- A negative value is the complement of 65536. For example, to move the position by N pitches to the left, specify it as:  $nL + nH \times 256 = 65536 - N$
- Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- In STANDARD MODE, this command uses the horizontal basic calculation pitch (x).
- In PAGE MODE, this command acts differently depending on the start point:
  - (1) If the start point specified by ESC T is top left or bottom right, the command specifies the relative position in the direction perpendicular to the paper feed (The character's side-to-side direction), using the horizontal basic calculation pitch (x).
  - (2) If the start point is top right or bottom left, the command specifies the relative position in the paper feed direction (The character's side-to-side direction), using the vertical basic calculation pitch (y).

**[See Also]** [ESC \\$](#), [GSP](#)

**[Sample Program]**

[Refer to Sample Program and Print Results for ESC \\$.](#)

# ESC a n

**[Function]**      Aligning the characters

**[Code]**            <1B>H<61>H<n>

**[Range]**           0≤n≤2, 48≤n≤50

**[Outline]**

- All the printed data within one line are aligned in the specified position.
- Depending on the value "n", positional alignment is carried out as shown in the table below.

n	Position
0, 48	Left end alignment
1, 49	Centering
2, 50	Right end alignment

**[Caution]**

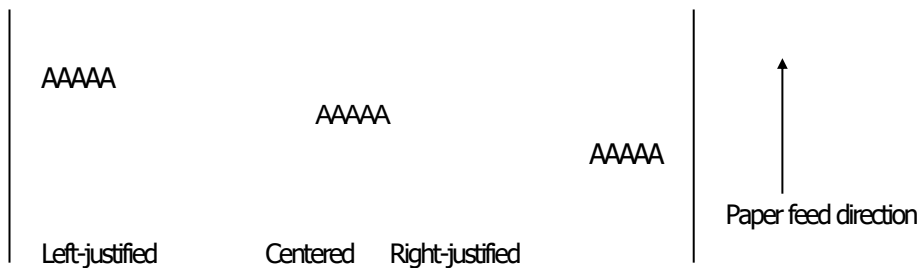
- This command is valid only when it is inputted at the beginning of a line.
- This command does not affect the PAGE MODE.
- Executes justification in the print area being set.

**[Default]**         n=0

**[Sample Program]**

```
LPRINT CHR$(&H1B);"a"; CHR$(0);  
LPRINT "AAAAA"; CHR$(&HA);  
LPRINT CHR$(&H1B);"a"; CHR$(1);  
LPRINT "AAAAA"; CHR$(&HA);  
LPRINT CHR$(&H1B);"a"; CHR$(2);  
LPRINT "AAAAA"; CHR$(&HA);
```

**[Print Results]**



# GS \$ nL nH

---

**[Function]** Specifying the absolute position of character vertical direction in PAGE MODE

**[Code]** <1D>H<24>H<nL><nH>

**[Range]**  $0 \leq nL \leq 255$ ,  $0 \leq nH \leq 255$

**[Outline]**

- Specifies the vertical position of character at the start point of data development in PAGE MODE using absolute position based on the start position.
- The position of vertical direction of character at the start position of next data development is the position  $[(nL+nH \times 256) \times \text{basic calculation pitch}]$  from the start position.

**[Caution]**

- This command is ignored except at PAGE MODE selection.
- Absolute position setting exceeding the specified print area is ignored.
- Position in horizontal direction of character at the start position of data development is not shifted.
- Start point used as the reference is set by ESC T.
- The following operation occurs at the start point of ESC T.
  - (1) When start point is set at "upper left" or "lower right", the absolute position of paper feed direction (vertical direction of character) is set. In this case, basic calculation pitch (y) of vertical direction is used.
  - (2) When start point is set at "upper right" or "lower left", the absolute position of vertical direction of paper feed (vertical direction of character) is set. In this case, basic calculation pitch (x) of horizontal direction is used.
- Basic calculation pitch is set by GS P.
- When fractional number is caused by the calculation, it is corrected by the minimum pitch of mechanism and the rest is discarded.

**[See Also]** [ESC \\$](#), [ESC T](#), [ESC W](#), [ESC \](#), [GS P](#), [GS \](#)

# GS L nL nH

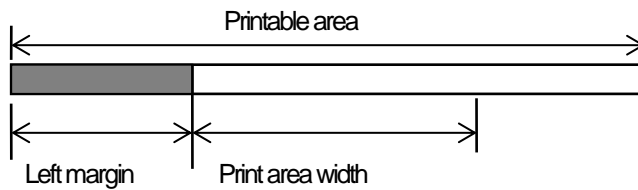
**[Function]** Setting the left margin

**[Code]** <1D>H<4C>H<nL><nH>

**[Range]**  $0 \leq nL \leq 255$ ,  $0 \leq nH \leq 255$

**[Outline]**

- This command sets the left margin specified by nL and nH.
- The value of the left margin is  $[(nL+nH \times 256) \times \text{basic calculation pitch}]$  inches.



**[Caution]**

- This command only works when it is entered at the beginning of a line.
- When PAGE MODE is selected, this command only executes the internal flagging of the printer.
- The setting of this command does not affect PAGE MODE.
- The maximum settable left margin is equal to the horizontal printable area. A setting greater than this maximum is trimmed to the maximum.
- The basic calculation pitch is defined by GS P. Once defined, the left margin is not changed if the basic calculation pitch is changed by GS P.
- The left margin is calculated with the horizontal basic calculation pitch (x) set by GS P. A fraction resulting from the calculation is corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- When you progress the first character in start of the line, if the print area specified is not wide enough to accommodate the wide of one character (\*Right space is contained.), only the line for that character data is handled as follows:
  - (1) The print area is extended toward the right to be equivalent to one character of the current font, but not wider than the printable area.
  - (2) If an area for one character cannot be provided as a result of step (1), the print area is extended toward the left. (So, the left margin is decreased.)
- When mapping non-character data (bit image, downloaded bit image, or bar code), if the print area specified is narrower than 9-bits, only the line for that data is handled as follows:
  - (1) The print area is extended toward the left (so, the left margin is decreased) until it is 9-dot wide, but not wider than the printable area.

**[Default]** nL=0, nH=0

**[See Also]** [GSP](#), [GSW](#)

# GS W nL nH

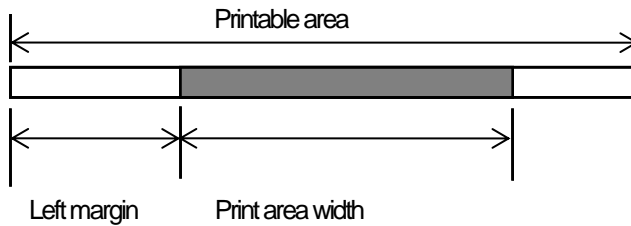
**[Function]** Setting the print area width

**[Code]** <1D>H<57>H<nL><nH>

**[Range]**  $0 \leq nL \leq 255$   
 $0 \leq nH \leq 255$

**[Outline]**

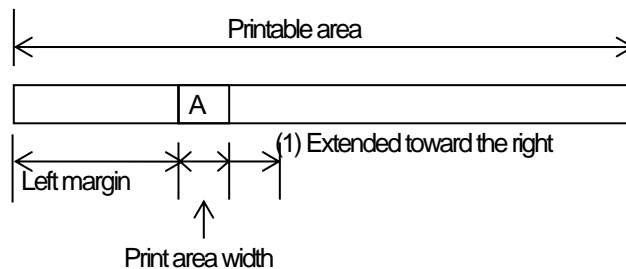
- Sets the print area width specified by nL and nH.
- The print area width will be  $[(nL+nH \times 256) \times \text{basic calculation pitch}]$  inches.



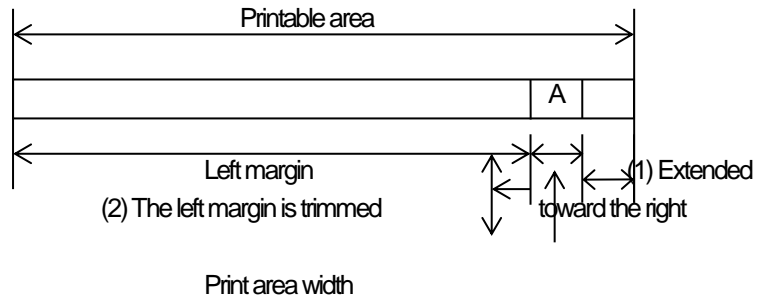
**[Caution]**

- This command only works when it is entered at the beginning of a line.
- When PAGE MODE is selected, this command only executes the internal flagging of the printer.
- The setting of this command does not affect PAGE MODE.
- If the value entered with this command exceeds the printable area for one line, the entire area except the left margin is set as the print area width.
- The basic calculation pitches are defined by GS P. Once defined, the print area width is not changed if the basic calculation pitch is changed by GS P.
- The print area width is calculated with the horizontal basic calculation pitch (x) defined by GS P. A fraction resulting from the calculation is corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- If the first character to be mapped at the beginning of a line has a width (including the right spacing) greater than the print area width, only that line is handled as follows:

(1) The print area is extended toward the right to accommodate the first character, but not wider than the printable area.



(2) If a sufficient area cannot be provided as a result of step (1), the print area is extended toward the left (so, the left margin is decreased).



(3) If a sufficient area cannot be provided as a result of step (2), the right spacing is trimmed.

- When mapping a bit image (or downloaded bit image), if the print area is narrower than the minimum width of the bit image (two dots for single density, or one dot for double density), only the line for that image is handled as follows:

(1) The print area is extended toward the left (so, the left margin is decreased) until it is equal to the minimum width of the image, but not wider than the printable area.

[Default]

paper width	print width/(dot)	nL	nH		support mod
80mm	72mm(576)	64	2	<b>PMU3300</b>	
58mm	51mm(408)	152	1	<b>PMU3300</b>	
58mm	48mm(384)	128	1	<b>PMU3300</b>	

[See Also]

[GSL](#), [GSP](#)

# GS \ nL nH

---

**[Function]** Specifying the relative vertical position of a character in PAGE MODE

**[Code]** <1D>H<5C>H<nL><nH>

**[Range]**  $0 \leq nL \leq 255$ ,  $0 \leq nH \leq 255$

**[Outline]**

- This command is used in PAGE MODE to specify the vertical position of a character in the data mapping start position, in a relative position with respect to the current position.
- The next data mapping start position will be at a point  $[(nL+nH \times 256) \times \text{basic calculation pitch}]$  inches away from the current position.

**[Caution]**

- This command is ignored when PAGE MODE is not selected.
- If a new position is specified for a character located beneath the current position, it should be specified as positive (+). If it is above the current position, it should be negative (-).
- A negative value is the complement of 65536. For example, to move the position by N pitches up, specify it as:  $nL + nH \times 256 = 65536 - N$
- The specification of a relative position outside the specified print area is ignored.
- Depending on the start point specified by ESC T, this command acts as follows:
  - (1) If the start point is the top left or bottom right, the command specifies the relative position in the paper feed direction (the character's top-bottom direction) using the vertical basic calculation pitch (y).
  - (2) If the start point is the top right or bottom left, the command specifies the relative position in the direction perpendicular to the paper feed (the character's top-bottom direction) using the horizontal basic calculation pitch (x).
- The basic calculation pitch is set by GS P.
- Fractions resulting from calculations are corrected with the minimum pitch of the mechanism, and the remainder is omitted.



## 2.2.5 Line Feed Span Commands

# ESC 2

---

**[Function]** Specifying 1/6-inch line feed rate

**[Code]** <1B>H<32>H

**[Outline]** The line feed rate per line is specified by 1/6 inch.

**[Caution]**

- Line feed rate can be specified respectively for both STANDARD MODE and PAGE MODE.

**[Default]** Approx. 4.23mm (1/360 inches)

# ESC 3 n

---

**[Function]** Setting line feed rate of minimum pitch

**[Code]** <1B>H<33>H<n>

**[Range]**  $0 \leq n \leq 255$

**[Outline]**  
Sets the line feed width per line to  $[n \times \text{basic calculation pitch}]$  inches.

**[Caution]**

- The line feed width can be set separately for the STANDARD and PAGE MODES.
- The basic calculation pitch is set by GS P. Once defined, the line feed width is not changed if the basic calculation pitch is changed by GS P.
- Fractions resulting from calculation are corrected with the minimum pitch of the mechanism, and the remainder is omitted.
- In STANDARD MODE, this command uses the vertical (paper feed direction) basic calculation pitch (y).
- In PAGE MODE, this command acts differently depending on the start point:
  - (1) If the start point specified by ESC T is top left or bottom right, the command uses the vertical (paper feed direction) basic calculation pitch (y).
  - (2) If the start point specified by ESC T is top right or bottom left, the command uses the horizontal (perpendicular to the paper feed direction) basic calculation pitch (x).
- The maximum settable line feed width is 1016 mm (40 inches). A setting greater than this maximum is trimmed to the maximum.

**[Default]**  
Approx. 4.23mm

**[See Also]** [ESC 2, GS P](#)

## 2.2.6 Bit Image Commands

# ESC \* m n1 n2 [d] k

**[Function]** Specifying the bit image mode

**[Code]** <1B>H<2A>H<m>H<n1><n2> [<d>] k

**[Range]** m=0, 1, 32, 33  
 0≤n1≤255, 0≤n2≤3  
 0≤d≤255  
 k=n1+256×n2 (m=0, 1), k=(n1+256×n2)×3 (m=32, 33)

**[Outline]**

- According to the number of dots specified in “n1”, “n2”, specify the bit image of mode “m”.
- The number of dots printed is divided by 256, whose quotient is taken as n2 and residual as “n1”. The total number of dots printed in the horizontal direction is equal to n1+(256×n2).
- When bit image data have been input in excess of dot positions that can be printed on one line, the excess data are discarded.
- “d” is bit image data. Bits to be printed are specified as “1” and those not as “0”.
- The bit image modes specified by “m” are shown as follows:

m	Mode	Vertical Direction		Horizontal Direction	
		Dot Count	Dot Density	Dot Density	Maximum Dot Count
0	8 dot single density	8	67dpi	101dpi	(1)
1	8 dot double density	8	67dpi	203dpi	(2)
32	24 dot single density	24	203dpi	101dpi	(3)
33	24 dot double density	24	203dpi	203dpi	(4)

[The specification which depend on the model]

(1) - (4) unit: dpi

support model	paper width	print width	(1)	(2)	(3)	(4)
PMU3300	80mm	72mm	286	576	286	576
PMU3300	58mm	51mm	204	408	204	408
PMU3300	58mm	48mm	192	384	192	384

**[Caution]**

- When the value of “m” is out of the above range, the data following after “n1” is processed as normal printing data.
- After completion of bit image printing, the printer returns to normal data processing mode.

# GS \* n1 n2 [d] n1xn2x8

**[Function]** Defining the download bit image

**[Code]** <1D>H<2A>H<n1><n2> [<d>] n1xn2x8

**[Range]**  
 $1 \leq n1 \leq 255$   
 $1 \leq n2 \leq 48$   
 $n1 \times n2 \leq 1536$

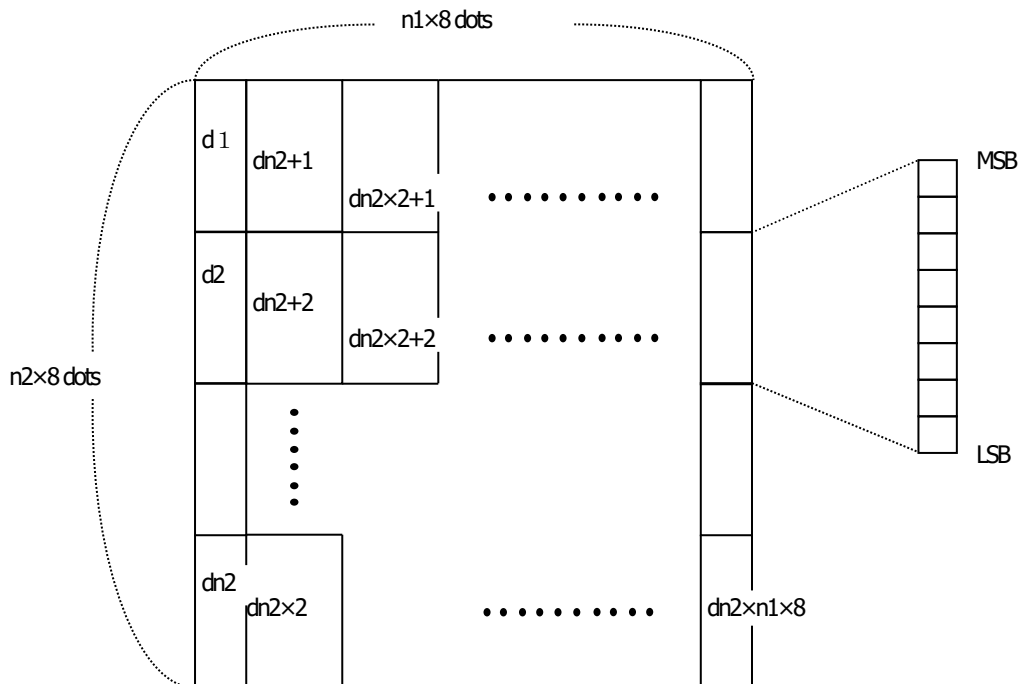
**[Outline]**

- Defines download bit images of the number of dots specified by “n1” and “n2”.
- The numbers of dots are n1x8 in horizontal direction and n2x8 in vertical direction.
- “7d” indicates bit image data.
- Once defined, the download bit image remains effective until it is redefined, ESC @, ESC &, GS (A, or FS q, is executed, or power is turned OFF.

**[Caution]**

- Relations between the bit image data and the dots defined are shown below.
- With this command executed, the defined content of a downloaded character is cleared.

**[See Also]** [GS/](#)



# GS / m

**[Function]** Printing the downloaded bit image

**[Code]** <1D>H<2F>H<m>

**[Range]**  $0 \leq m \leq 3$ ,  $48 \leq m \leq 51$

**[Caution]**

- Prints downloaded bit image in a mode specified by “m”.
- Modes that can be selected by “m” are shown below.

m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0, 48	NORMAL MODE	203DPI	203DPI
1, 49	DOUBLE WIDTH MODE	203DPI	101DPI
2, 50	DOUBLE HEIGHT MODE	101DPI	203DPI
3, 51	QUADRUPLE SIZE MODE	101DPI	101DPI

**[Caution]**

- When a downloaded bit image has not been defined, this command is ignored.
- When data exist in the print buffer, this command is ignored.
- A portion of a downloaded bit image exceeding one line length is not printed.

**[See Also]** [ESC & GS\\*](#)

# GS v 0 m xL xH yL yH d1 ... dk

**[Function]** Printing of raster bit image

**[Code]** <1D>H<76>H<30>H<m><xL><xH><yL><yH> [<d>]k

**[Range]**  $0 \leq m \leq 3$ ,  $48 \leq m \leq 51$ ,  $0 \leq xL \leq 255$ ,  $0 \leq xH \leq 255$ ,  
 $0 \leq yL \leq 255$ ,  $0 \leq yH \leq 8$ ,  $0 \leq d \leq 255$ ,  
 $k = (xL + xH \times 256) \times (yL + yH \times 256)$ , however,  $k \neq 0$

**[Outline]**

- Prints raster bit images in mode “m”.

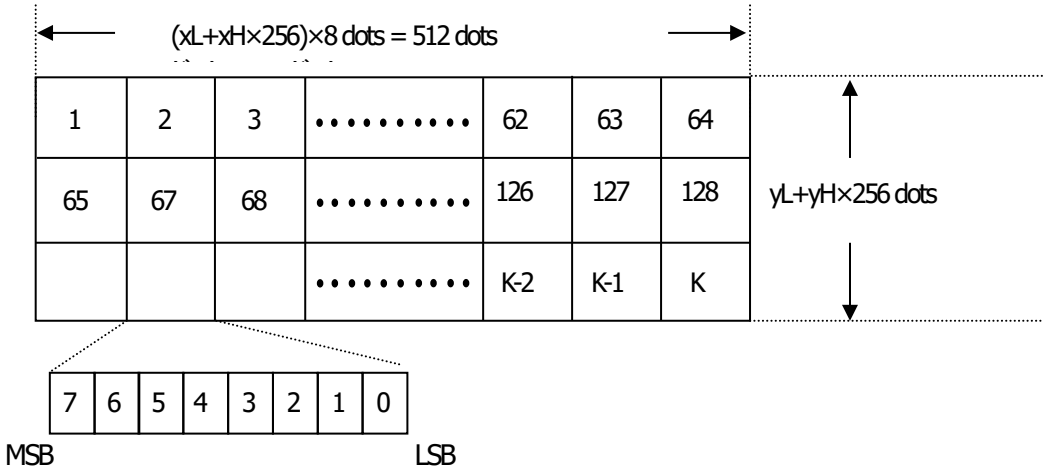
m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0, 48	NORMAL MODE	203dpi	203dpi
1, 49	DOUBLE WIDTH MODE	203dpi	101dpi
2, 50	DOUBLE HEIGHT MODE	101dpi	203dpi
3, 51	QUADRUPLE SIZE MODE	101dpi	101dpi

- xL, xH specify the number of data in horizontal direction of the bit image to  $(xL + xH \times 256)$  bytes.
- yL, yH specify the number of data in vertical direction of the bit image to  $(yL + yH \times 256)$  bytes.

**[Caution]**

- Any of the print modes (character size, emphasis, double strike, inverting, underlining, back-to-white reversing, etc.) does not affect the raster bit image.
- If the print area specified by GS L and GS W is narrower than a minimum width, the print area for that line only is extended to the minimum width. The minimum width is one dot in NORMAL MODE (m=0, 48) and DOUBLE HEIGHT MODE (m=2, 50), and 2 dots in DOUBLE WIDTH MODE (m=1, 49) and QUADRUPLE SIZE MODE (m=3, 51).
- Any part of data that is out of the print area is only read and discarded in units of dot.
- The print start position can arbitrarily be specified with HT (horizontal tab), ESC \$ (specifying absolute position), ESC \ (specifying relative positions), and GS L (setting left margins). Note that if the print start position is not a multiple of 8, the printing speed may decrease.
- The setting of ESC a (aligning characters) are also valid for the raster bit image.
- If this command is executed during macro definition, the macro definition is suspended, and the processing of the command starts. The macro is left undefined.
- “d” denotes defined data. Dots to be printed are specified as “1”, and those not to be printed as “0”.
- Valid only when no print data is present in the print buffer at the selection of STANDARD MODE.

[Example] When  $x_L + x_H \times 256 = 64$





## 2.2.7 Status Commands

# DLE EOT n

---

**[Function]** Sending status in real-time

**[Code]** <10>H<04>H<n>

**[Range]** 1≤n≤4

**[Outline]**

- Sends in real-time the status specified by “n”.

n	Status
1	Printer status
2	Status caused by an offline condition
3	Status caused by an error
4	Continuous paper detector status

**[Caution]**

- Each status represents the current status. It is 1 byte data.
- The status is transferred without checking whether the host is ready to receive or busy.
- This command is executed even if the printer is in offline state, receive-buffer full state, or error state.
- This command is dealt with when it is received.
- With serial interface specifications, this command is executed in offline state, receiving buffer full state, and error state.
- With parallel interface specifications, this command cannot be executed while the printer is in Busy state. When memory SW1-3 is ON, the printer does not enter Busy state in the offline state and error state.
- If ASB (Automatic Status Back) is enabled by GS a, it is necessary to discriminate between the status due to ASB and the status due to this command
- This command can be executed even if printer setting by ESC = is invalid.
- If another data string of 10H 04H n (1 n 4) is received, the printer acts the same way as with this command. Therefore, the user should be reminded of this fact.

[Example 1]

Suppose a command “ESC \* m nL nH [d1 ... dk]”, where d1 = 10H, d2 = 04H, d3 = 01H.

- The DLE EOT n command cannot be interleaved into the code string of another command consisting of 2 bytes or more.

[Example 2]

If the printer sends DLE EOT 3 after the host has sent up to ESC 3 in its attempt to send ESC 3 n, the printer handles the ESC 3 as ESC 3 10H. Thus, the user should be cautious.

**[See Also]**

[Appendix 5.3 “Identification of Send Status”](#)  
[DLE ENQ](#), [ESC c 4](#), [GS a](#), [GS r](#)

PMU3300

(1) Printer status (When n = 1 is specified)

Bit	Status	Hex.	Decimal
0	Fixed	00H	0
1	Fixed	02H	2
2	Fixed	00H	0
3	Online status	00H	0
	Offline status	08H	8
4	Fixed	10H	16
5	Not waiting online recovery	00H	0
	Waiting online recovery	20H	32
6	FEED switch is not pressed	00H	0
	FEED switch is pressed	40H	64
7	Fixed	00H	0

(2) Status caused by an offline condition (When n = 2 is specified)

Bit	Status	Hex.	Decimal
0	Fixed	00H	0
1	Fixed	02H	2
2	Head-down	00H	0
	Head-up	04H	4
3	Not in paper feed state triggered by FEED switch	00H	0
	In paper feed state triggered by FEED switch	08H	8
4	Fixed	10H	16
5	Printing is not stopped because of "paper out" state	00H	0
	Printing is stopped because of "paper out" state	20H	32
6	Error not occurred	00H	0
	Error occurred	40H	64
7	Fixed	00H	0

Bit 5: Printing is stopped if the Paper-end detector detects a "paper out" state, or if the printer is out of paper when the Paper Near-end Sensor is enabled by ESC c 4. At this time, bit 5 = 1.

(3) Status caused by an error (when n = 3 is specified)

Bit	Status	Hex.	Decimal
0	Fixed	00H	0
1	Fixed	02H	2
2	No paper jam error occurred.	00H	0
	A paper jam error occurred.	04H	4
3	Auto cutter error not occurred	00H	0
	Auto cutter error occurred	08H	8
4	Fixed	10H	16
5	Unrecoverable error not occurred	00H	0
	Unrecoverable error occurred	20H	32
6	Auto recovery error not occurred	00H	0
	Auto recovery error occurred	40H	64
7	Fixed	00H	0

Bit 2: In case of MSW3-8=ON, it is generated by cover-open.

Bit 3: If this error occurred because of a paper jam, for example, remove the cause of the error, and then DLE ENQ n (1≤n≤2) can be used to recover from the error. However, it is not possible to recover from any error due to a circuit problem (e.g., broken wire).

Bit 6: If a head overheat error is detected, the printing is stopped until the head temperature falls. At this time, bit 6 = 1.

(4) Continuous paper detector status (When n = 4 is specified)

<b>Bit</b>	<b>Status</b>	<b>Hex.</b>	<b>Decimal</b>
0	Fixed	00H	0
1	Fixed	02H	2
2,3	Paper found by Paper-near-end Sensor	00H	0
	Paper not found by Paper-near-end Sensor	0CH	12
4	Fixed	10H	16
5	Paper found by Paper-end Sensor	00H	0
	Paper not found by Paper-end Sensor	20H	32
6	Paper found by Paper-exit Sensor	00H	0
	Paper not found by Paper-exit Sensor	40H	64
7	Fixed	00H	0

# ESC v

**[Function]** Transmission of printer status

**[Code]** <1B>H<76>H

**[Outline]**

- Transmits current printer status.

**[Caution]**

- Status is transmitted in 1byte with the content shown in the following table.
- In case of DTR/DSR control, only 1byte is transmitted after making sure the host is ready for reception (DSR signal is in the Space state). In case of XON/XOFF control, only 1byte is transmitted without checking the status of DSR signal.
- In case of DTR/DSR, if the host is not ready for reception (DSR signal in Mark state, wait till reception is available.
- Paper-end status causes BUSY status, thus this command may be in the receive-not-ready status.
- This command is valid only when MSW3-7 is set to ON.

Bit	Position	Value	
		0	1
0	Paper Near-end	With paper	No paper
1	Undefined	-	-
2	Paper-end	With paper	No paper
3	Undefined	-	-
4	Unused	Fixed	-
5	Undefined	-	-
6	Undefined	-	-
7	Undefined	-	-

Bit 2: In case of Paper End, as this printer goes offline, this command is not executed.  
Therefore, status "No Paper (04H)" is never transmitted.

- Bit 0 is set to 00H because Paper-Near End sensor is not supported.

**[Sample Program]**

```
OPEN "COM1:N81NN" AS #1 -> OPEN statement varies with the type of BASIC.  
PRINT #1, CHR$(&H1B);"v";  
A$ = INPUT$(1,#1)  
CLOSE #1
```

# GS a n

**[Function]** Enabling/disabling ASB (Automatic Status Back)

**[Code]** <1D>H<61>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- This command selects the status item to be addressed by ASB (Automatic Status Back.)

Bit	Status Item Addressed by ASB	Hex.	Decimal
0	Status of pin 3 of drawer kick-out connector = Disabled	00H	0
	Status of pin 3 of drawer kick-out connector = Enabled	01H	1
1	Online/offline status = Disabled	00H	0
	Online/offline status = Enabled	02H	2
2	Error status = Disabled	00H	0
	Error status = Enabled	04H	4
3	Continuous Paper Sensor = Disabled	00H	0
	Continuous Paper Sensor = Enabled	08H	8
4	Undefined	-	-
5	Undefined	-	-
6	Undefined	-	-
7	Undefined	-	-

**[Caution]**

- If any status item is enabled, the status is sent to the host when this command is executed. After that time on, the status is sent each time an enabled status item changes. Because each status item represents the current condition, status items disabled for ASB may also have changed.
- The ASB function is disabled if all status items are disabled.
- If the ASB function is enabled by default, the host receives the status the first time the printer gets ready for communication after it is turned on.
- The printer sends 4 bytes of status shown in the tables below, without checking whether the host is ready to receive or busy. The 4 bytes of status is a continuous string except for XOFF code.
- Because this command is executed when data is mapped in the receive buffer, there may be a delay between command receiving and status sending depending on the condition of the receive buffer.
- Even if the printer is excluded from the selection of peripheral equipment ESC =, the 4 bytes of status is sent to the host whenever status changes.
- When DLE EOT, GS I, or GS r is used, the host must discriminate between the status specified by these commands and the status due to ASB.

- Bit 2 of the 1st byte (printer information) of the status sent in 4 bytes is set to 00H because drawer is not supported.

(1) 1st byte (Printer information)

Bit	Status	Hex.	Decimal
0	Unused	00H	0
1	Unused	00H	0
2	Status of pin 3 of drawer kick-out connector = "L"	00H	0
	Status of pin 3 of drawer kick-out connector = "H"	04H	4
3	Online status	00H	0
	Offline status	08H	8
4	Unused	10H	16
5	Cover closed	00H	0
	Cover open	20H	32
6	Not in paper feed state triggered by FEED switch	00H	0
	In paper feed state triggered by FEED switch	40H	64
7	Unused	00H	0

## (2) 2nd byte (Error occurrence information)

Bit	Status	Hex.	Decimal
0	Undefined	-	-
1	Undefined	-	-
2	No paper jam error occurred. No BM detection error occurred.(only when BM paper is selected) No presenter error occurred. (only when presenter function is enabled.)	00H	0
	A paper jam error occurred. A BM detection error occurred.(only when BM paper is selected) A presenter error occurred (only when presenter function is enabled.)	04H	4
3	Auto cutter error not occurred	00H	0
	Auto cutter error occurred	08H	8
4	Unused	00H	0
5	Unrecoverable error not occurred	00H	0
	Unrecoverable error occurred	20H	32
6	Auto recovery error not occurred	00H	0
	Auto recovery error occurred	40H	64
7	Unused	00H	0

\*Bit 2: In case of MSW3-8=ON, it is generated by cover-open.

At BM/Label model, it is generated by BM/Label-error.

At presenter model, it is generated at presenter error.

\*Bit 3: If this error occurred because of a paper jam, for example, remove the cause of the error, and then DLE ENQ n (1 n 2) can be used to recover from the error. However, it is not possible to recover from any error due to a circuit problem (e.g., broken wire).

\*Bit 6: If a head overheat error is detected, the printing is stopped until the head temperature falls. At this time, bit 6 = 1.

## (3) 3rd byte (Paper Sensor information)

Bit	Status	Hex.	Decimal
0, 1	Paper found by Paper Near-end Sensor	00H	0
	Paper not found by Paper Near-end Sensor	03H	3
2, 3	Paper found by Paper-end Sensor	00H	0
	Paper not found by Paper-end Sensor	0CH	12
4	Unused	00H	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00H	0

(4) 4th byte (Paper Sensor information)

In case of MSW3-7 ON

Bit	Status	Hex.	Decimal
0	Undefined	-	-
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00H	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00H	0

In case of MSW3-7 OFF (CBM1000 non-compatible mode)

Bit	Status	Hex.	Decimal
0	Reserved	01H	1
1	Reserved	02H	2
2	Reserved	04H	4
3	Reserved	08H	8
4	Fixed	00H	0
5	Reserved	00H	00
6	Reserved	00H	00
7	Fixed	00H	0

**[Default]** When MSW 1-3 OFF : n=0  
When MSW 1-3 ON : n=2

**[See Also]** [DLE EOT, GSr](#)



# GS r n

---

**[Function]** Sending status

**[Code]** <1D>H<72>H<n>

**[Range]**  
n=1, 49

**[Outline]**

- Sends the specified status to the host.

n	Function
1, 49	Sends the Paper Sensor status.
2, 50	Sends the Drawer Kick-out Connector status.

**[Caution]**

- When the serial interface is used:
  - For DTR/DSR control:

The printer sends the status after verifying that the host is ready to receive. If the host is not ready to receive, the printer waits for the host to become ready to receive.
  - For XON/XOFF control:

The printer sends the status without checking whether the host is ready to receive or busy.
- Because this command is executed when data is mapped in the receive buffer, there may be a delay between receiving the command and sending the status depending on the condition of the receive buffer.
- If ASB (Automatic Status Back) is enabled by GS a, the host must discriminate between the status due to this command and the status due to ASB.
- Whenever the Paper-end Sensor detects a “paper out” state, the printer goes offline, and the command is not executed. Therefore, the printer never sends a status “No paper in Paper-end detector (0CH)”.
- At the setting of MSW3-7 OFF, paper sensor status is fixed to 00h.

• Paper Sensor status (n=1, 49)

Bit	Status	Hex.	Decimal
0, 1	Paper found by Paper Near-end Sensor	00H	0
	Paper not found by Paper Near-end Sensor	03H	3
2, 3	Paper found by Paper-end Sensor	00H	0
	Paper not found by Paper-end Sensor	(0CH)	(12)
4	Unused	00H	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00H	0

• Drawer kick-out connector status (n=2, 50)

Bit	Status	Hex.	Decimal
0	Status of pin 3 of drawer kick connector = "L"	00H	0
	Status of pin 3 of drawer kick connector = "H"	01H	1
1	Undefined	-	-
2	Undefined	-	-
3	Undefined	-	-
4	Unused	00H	0
5	Undefined	-	-
6	Undefined	-	-
7	Unused	00H	0

[See Also]

[Appendix 5.3 "Identification of Send Status"](#)

[DLE EOT, GS a](#)

## 2.2.8 Paper Detecting Commands

# ESC c 3 n

**[Function]** Selecting the Paper Sensor valid for a Paper-end signal output

**[Code]** <1B>H<63>H<33>H<n>

**[Range]**  $0 \leq n \leq 255$

**[Outline]**

- This command selects by which Paper Sensor a Paper-end signal should be output. Each bit for “n” has the following meaning:

Bit	Position	Value	
		0	1
0	Paper Near-end	Disabled	Enabled
1	Paper Near-end	Disabled	Enabled
2	Paper-end	Disabled	Enabled
3	Paper-end	Disabled	Enabled
4	Undefined	—	—
5	Undefined	—	—
6	Undefined	—	—
7	Undefined	—	—

**[Caution]**

- This command is valid only for the parallel interface.

**[Default]**

n=15 (no signal at paper near end due to no paper near end sensor.)

# ESC c 4 n

**[Function]** Selecting the Paper Near-end Sensor valid for print stop

**[Code]** <1B>H<63>H<34>H<n>

**[Range]**  $0 \leq n \leq 255$

**[Outline]**

- This command selects the Paper Near-end Sensor which helps to stop printing when the paper supply almost runs out.
- Each bit for “n” has the following meaning:

Bit	Position	Value	
		0	1
0	Paper Near-end	Disabled	Enabled
1	Paper Near-end	Disabled	Enabled
2	Undefined	-	-
3	Undefined	-	-
4	Undefined	-	-
5	Undefined	-	-
6	Undefined	-	-
7	Undefined	-	-

**[Caution]**

- This printer can only select one kind of Paper Sensor, a Paper Near-end Sensor.

**[Default]** n=0

## 2.2.9 Panel Switch Commands

# ESC c 5 n

---

**[Function]** Enabling/disabling the panel switches

**[Code]** <1B>H<63>H<35>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- Enabling/disabling the FEED switch.
- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Condition
0	FEED switch (LF-SW signal) valid
1	FEED switch (LF-SW signal) invalid

**[Caution]**

- When the FEED switch is disabled with this command, the paper cannot be fed by operating the FEED switch.
- While switch operation is waited at the execution of macro, the FEED switch is always enabled regardless of the setting of this command but no paper feed operation is carried out.

**[Default]** n=0

**[Sample Program]**

LPRINT CHR\$(&H1B);"c5";CHR\$(0); — When enabling the FEED switch

LPRINT CHR\$(&H1B);"c5";CHR\$(1); — When disabling the FEED switch

## 2.2.10 Macro Commands

# GS :

**[Function]** Starting/ending macro definition

**[Code]** <1D>H<3A>H

**[Outline]**

- Specifying starting/ending macro definition.
- Reception of this command during macro definition signifies ending the macro definition.

**[Caution]**

- Maximum content available for macro definition is 2048 bytes. A portion exceeding 2048 bytes is not defined.
- When GS ^ is processed in macro definition, the macro definition is stopped and the content of definition is cleared.
- Even with ESC @ (Initialization of the printer) having been executed, defined content is not cleared. Therefore, it is possible to include ESC @ into the content of macro definition.
- Normal printing operation is carried out even during macro definition.

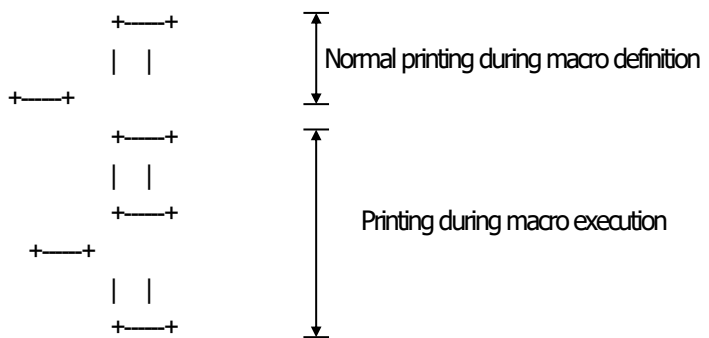
**[Default]** The initial value is not defined.

**[See Also]** [GS ^](#)

**[Sample Program]**

```
LPRINT CHR$(&H1D);";";
LPRINT "+---+";CHR$(&HA);
LPRINT "| |"; CHR$(&HA);
LPRINT "+---+"; CHR$(&HA);
LPRINT CHR$(&H1D);";";
LPRINT CHR$(&H1D);"";
LPRINT CHR$(2); CHR$(10); CHR$(0);
```

**[Print Results]**



# GS ^ n1 n2 n3

---

**[Function]** Executing the macro

**[Code]** <1D>H<5E>H<n1><n2><n3>

**[Range]**  $0 \leq n1 \leq 255$   
 $0 \leq n2 \leq 255$   
 $0 \leq n3 \leq 1$

**[Outline]**

- Executing contents defined in macro.
- n1 : The number of times of macro execution
- n2 : Waiting time on macro execution: Waiting time of n2 x 100 msec is given for every execution.
- n3 : Macro execution mode
  - n3 = 0 Continuous execution: The Macro is executed “n1” times continuously at the time interval specified by “n2”.
  - n3 = 1 Execution by FEED Switch: After waiting for the time specified by “n2”, the ARARM LED flickers and the FEED switch is waiting to be pressed. When it is pressed, the macro is executed once. This action is repeated “n1” times.

**[Caution]**

- When this command is received while in macro definition, suspension of macro definition is indicated. At this time, the defined content is cleared.
- No execution takes place when the macro is held undefined.
- While in macro execution with n3 = 1, paper feed with the FEED switch is not available.
- When MSW2-3 ON Spool print valid is specified, n2 is invalid.

**[See Also]** [GS:](#)

**[Sample Program]**

[Refer to Sample Program and Print Results for GS:](#)

## 2.2.11 Cutter Commands

# ESC i

**[Function]** Full cutting of paper

**[Code]** <1B>H<69>H

**[Outline]**

- Executes full cutting of paper.

**[Caution]**

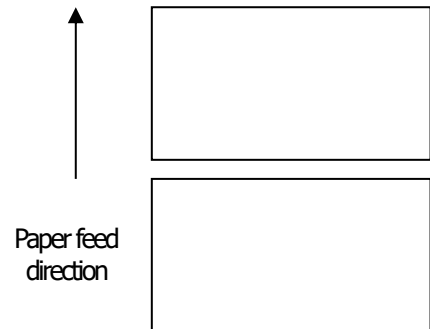
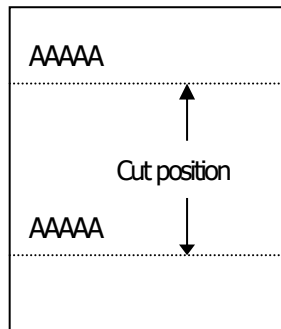
- This command only works if it is entered at the beginning of a line.
- Before cutting paper, feed the paper more than the cutting position of paper from the print position. Without this paper feeding, the character just after printing remains before the cutter.

MSW4-8=ON: This command works as partial cut command.

**[Sample Program]**

```
LPRINT "AAAAA";  
LPRINT CHR$(&H1B);"J";  
LPRINT CHR$(150);  
LPRINT CHR$(&H1B);"I";
```

**[Print Results]**





# ESC m

**[Function]** Partial cutting of paper

**[Code]** <1B>H<6D>H

**[Outline]**

- Executes partial cutting of paper.

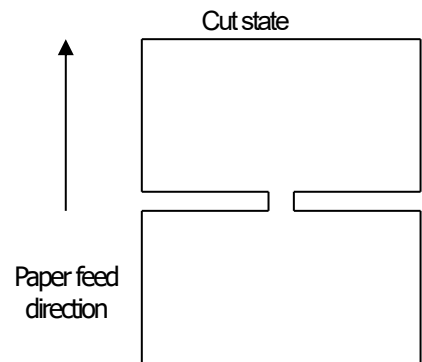
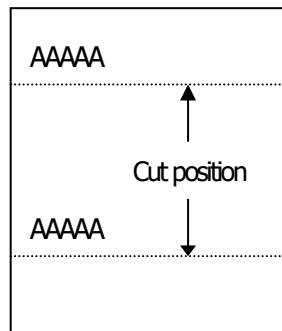
**[Caution]**

- This command only works if it is entered at the beginning of a line.
- Before cutting paper, feed the paper more than the cutting position of paper from the print position. Without this paper feeding, the character just after printing remains before the cutter.

**[Sample Program]**

```
LPRINT "AAAAA";  
LPRINT CHR$(&H1B);"J";  
LPRINT CHR$(150);  
LPRINT CHR$(&H1B);"m";
```

**[Print Results]**



# GS V m -- (1)

# GS V m n -- (2)

**[Function]** Cutting the paper

**[Code]** (1)<1D>H<56>H<m>  
(2)<1D>H<56>H<m><n>

**[Range]** (1) $0 \leq m \leq 1, 48 \leq m \leq 49$   
(2) $m = 65, 66$   
 $0 \leq n \leq 255$

**[Outline]**

- Performs the specified paper cutting.

m	Function
0, 48	Full cut
1, 49	Partial cut (Leaving a bridge area uncut)
65	Paper feed by "cut position + {n×basic calculation pitch}" and full cut
66	Paper feed by "cut position + {n×basic calculation pitch}" and partial cut

**[Caution]**

- In STANDARD MODE, this command only works when it is entered at the beginning of a line.
- Control to make the length of cut paper less than 10 mm is not executed.

For (1):

- Executes cutting of paper.

For (2):

- If  $n = 0$ , the paper is fed to the cut position, and then cut. If  $n \neq 0$ , the paper is fed by "n x basic calculation pitch" inches past the cut position, and then cut.
- The basic calculation pitch is set by GS P. The paper feed amount is calculated with the vertical basic calculation pitch (y). A fraction resulting from the calculation is corrected with the minimum pitch of the mechanism, and the remainder is omitted.

MSW4-8=ON: This command works as partial cut command only.

## 2.2.12 Bar Code Commands

# GS H n

**[Function]** Selecting of printing position of HRI characters

**[Code]** <1D>H<48>H<n>

**[Range]** 0≤n≤3, 48≤n≤51

**[Outline]**

- Selecting printing position of HRI characters in printing bar codes.
- “n” means the followings.

n	Printing Position
0, 48	No printing
1, 49	Above the bar code
2, 50	Below the bar code
3, 51	Both above and below the bar code

The HRI characters refer to the bar code-turned characters so that you can read them.

**[Default]** n=0

**[See Also]** [GSf](#), [GSk](#)

**[Sample Program]**

```

LPRINT CHR$(&H1B);"3"; CHR$(5);
LPRINT CHR$(&H1D);"h"; CHR$(50);
LPRINT CHR$(&H1D);"H"; CHR$(0);
GOSUB BC
LPRINT CHR$(&H1D);"H"; CHR$(1);
GOSUB BC
LPRINT CHR$(&H1D);"H"; CHR$(2);
GOSUB BC
LPRINT CHR$(&H1D);"H"; CHR$(3);
GOSUB BC
END
BC:
LPRINT CHR$(&H1D);"k";
LPRINT CHR$(4);
LPRINT "12"; CHR$(0);
LPRINT CHR$(&HA);
RETURN
    
```

**[Print Results]**



# GS f n

**[Function]** Selecting the font of HRI characters

**[Code]** <1D>H<66>H<n>

**[Range]** 0≤n≤2, 48≤n≤50

**[Outline]**

- Selecting the font of HRI characters in printing bar code.
- The type of font can be selected with “n” as follows:

n	Font
0, 48	Font A (12×24)
1, 49	Font B (9×17)
2, 50	Font C (8×16)

**[Caution]**

- The HRI characters are printed at the position specified with GS H.

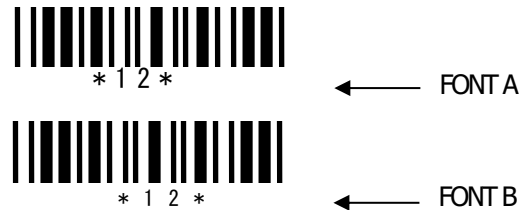
**[Default]** n=0

**[See Also]** [GSH](#)

**[Sample Program]**

```
LPRINT CHR$(&H1D);"h"; CHR$(50);
LPRINT CHR$(&H1D);"H"; CHR$(2);
LPRINT CHR$(&H1D);"T"; CHR$(0);
GOSUB BC
LPRINT CHR$(&H1D);"t"; CHR$(1);
GOSUB BC
END
BC:
LPRINT CHR$(&H1D);"k";
LPRINT CHR$(4);
LPRINT "12"; +CHR$(0);
LPRINT CHR$(&HA);
RETURN
```

**[Print Results]**



# GS h n

---

**[Function]** Specifying the height of the bar code

**[Code]** <1D>H<68>H<n>

**[Range]**  $1 \leq n \leq 255$

**[Outline]**

- Selecting bar code height.
- “n” denotes the number of dots in the vertical direction.

**[Sample Program]**

[Refer to Sample Program and Print Results for GS w.](#)

# (1)GS k m [d1...dk] NUL

## (2)GS k m n [d1...dn]

**[Function]** Printing the bar code

**[Code]** (1)<1D>H<6B>H<m> [d1...dk] NULL  
 (2)<1D>H<6B>H<m><n> [d1...dn]

**[Range]** (1)0≤m≤6 The definitions of “k” and “d” vary with the bar code system.  
 (2)65≤m≤73 The definitions of “n” and “d” vary with the bar code system.

**[Outline]**

- Selects a bar code system and prints the bar code.

For (1):

m	Bar Code System	Range of “k”	Range of “d”
0	UPC-A	11≤k≤12	48≤d≤57
1	UPC-E	11≤k≤12	48≤d≤57
2	JAN13(EAN)	12≤k≤13	48≤d≤57
3	JAN8(EAN)	7≤k≤8	48≤d≤57
4	CODE39	1≤k	48≤d≤57, 65≤d≤90 32, 36, 37, 43, 45, 46, 47
5	ITF	1≤k (An even number)	48≤d≤57
6	CODABAR	1≤k	48≤d≤57, 65≤d≤68 36, 43, 45, 46, 47, 58

For (2):

m	Bar Code System	Range of “n”	Range of “d”
65	UPC-A	11≤n≤12	48≤d≤57
66	UPC-E	11≤n≤12	48≤d≤57
67	JAN13(EAN)	12≤n≤13	48≤d≤57
68	JAN8(EAN)	7≤n≤8	48≤d≤57
69	CODE39	1≤n≤255	48≤d≤57, 65≤d≤90 32, 36, 42, 43, 45, 46, 47
70	ITF	1≤n≤255 (An even number)	48≤d≤57
71	CODABAR	1≤n≤255	48≤d≤57, 65≤d≤68 36, 43, 45, 46, 47, 58
72	CODE93	1≤n≤255	0≤d≤127
73	CODE128	2≤n≤255	0≤d≤127
75	GS1 DataBar mndirectional	n=13	48≤d≤57
76	GS1 DataBar Truncated	n=13	48≤d≤57
77	GS1 DataBar Limited	n=13	48≤d≤57
78	GS1 DataBar Expanded	2≤n≤255	0≤d≤127

**[Caution]**

For (1):

- This command ends with a NULL code.
- For UPC-A or UPC-E, the bar code is printed when 12 bytes of bar code data have been entered, and the subsequent data is handled as normal data.
- For JAN13, the bar code is printed when 13 bytes of bar code data have been entered, and the subsequent data is handled as normal data.
- For JAN8, the bar code is printed when 8 bytes of bar code data have been entered, and the subsequent data is handled as normal data.
- The data of ITF bar code must have an even number of columns. Should the data have an odd number of columns, the last column is ignored.

For (2):

- Numeral “n” indicates the number of data items, and the subsequent “n” bytes of data are handled as bar code data.
- If “n” is out of the range, the processing of the command is aborted, and the subsequent data is handled as normal data.

For STANDARD MODE:

- If “d” is out of the range, only a paper feed is executed, and the subsequent data is handled as normal data.
- If the bar code is wider than the print area for one line, the bar code is not printed, but only a paper feed is executed.
- The amount of paper feed corresponds to the height of the bar code (including the HRI characters if HRI character printing is specified), irrespective of the line feed width set by a command such as ESC 2 or ESC 3.
- This command only works if no data exists in the print buffer. If any data exists in the print buffer, the data subsequent to “m” is handled as normal data.
- After the bar code is printed, the beginning of the line is taken as the start position for the next print.
- This command is not affected by any print modes (emphasis, double strike, underline, and character size), except for the inverted character mode.

For PAGE MODE:

- This command only maps the bar code, without performing a printout. After the bar code is mapped, the dot next to the last data item of the bar code is taken as the start position for the next data mapping.
- If “d” is out of the range, the processing of the command is aborted, and the subsequent data is handled as normal data. In this case, the data mapping start position does not move.
- If the bar code is wider than the print area, the bar code is not printed, but the data mapping start position is moved to the left end of the non-print area.

## [Description of Bar Codes]

- UPC-A** This bar code, consisting of numerals only, has a fixed length of 12 columns; a 11-column number entered from the host or application software plus a check digit (12th column) automatically calculated inside the printer. If the 12th-column numeral is sent from the host, the entire bar code will be printed as it is.
- UPC-E** This bar code, consisting of numerals only, has a fixed length of 8 columns. This printer compresses the 11- or 12-digit data (with check digit) entered to 8 digits by using zero suppression of UPC-E standard and then prints the data. Indicates an example of data compression based on zero suppression.  
\*The printer does not print bar code except the following conditions.  
Ex.) Original code shall be (0-ABCDE-VWXYZ)...11 digits (with no check digit specified).  
Printable patterns are as follows:
1. When V - Y are all "0": "0-ABCDE-0000Z"⇒"ABCDEZ".  
\*Provided only 5 - 9 are applied to Z.
  2. When E and VWXY are all "0": "0-ABCD0-0000Z"⇒"ABCDZ4".  
\*The last character 4 indicates that maker codes A and D are not "0".
  3. When DE and VWX are "0": "0-ABC00-000YZ"⇒"ABCYZ3".  
\*The last character 3 indicates that A and C are not "0" and ABC is a number of 3 digits.
  4. When DE and VW are "0" and C is "0", "1", or "2":  
(1)When C="0": "0-AB000-00XYZ"⇒"ABXYZ0".  
(2)When C="1": "0-AB100-00XYZ"⇒"ABXYZ1".  
(3)When C="2": "0-AB200-00XYZ"⇒"ABXYZ2".
  5. The check digit of 12th column is automatically calculated in the printer.
- JAN-13(EAN)** This bar code, consisting of numerals only, has a fixed length of 13 columns; a 12-column number entered from the host or application software plus a check digit (13th column) automatically calculated inside the printer. If the 13th-column numeral is sent from the host, the entire bar code will be printed as it is.
- JAN-8(EAN)** This bar code, consisting of numerals only, has a fixed length of 8 columns; a 7- column number entered from the host or application software plus a check digit (8<sup>th</sup> column) automatically calculated inside the printer. If the 8th-column numeral is sent from the host, the entire bar code will be printed as it is.
- CODE39** This bar code, consisting of upper-case alphabetic characters and numerals, has a variable length of columns. The start/stop code "\*" is automatically added by the printer. The available characters include space and "\$ % + - . / 0 1 2 3 4 5 6 7 8 9" and upper-case alphabetic characters.
- ITF** This bar code, consisting of only numerals, has a variable length of even-number columns. If a code of odd-number columns is sent, the bar code will not be printed.
- CODABAR(NW-7)** This bar code, consisting of alphanumeric, has a variable length of columns. Available characters include "0 1 2 3 4 5 6 7 8 9 A B C D \$ + - . / :". A start/stop code is required; any one of A, B, C, and D is used.
- CODE93** This bar code, consisting of alphanumeric and control characters, has a variable length of columns. The HRI character string is preceded and followed by a "■" character. HRI characters for control characters (00H - 1FH, and 7FH) are each printed as a



combination of a “■” character and an alphabetic character.

Control Character		HRI Character	Control Character		HRI Character
ASCII	Hex.		ASCII	Hex.	
NUL	00H	■U	DLE	10H	■P
SOH	01H	■A	DC1	11H	■Q
STX	02H	■B	DC2	12H	■R
ETX	03H	■C	DC3	13H	■S
EOT	04H	■D	DC4	14H	■T
ENQ	05H	■E	NAK	15H	■U
ACK	06H	■F	SYN	16H	■V
BEL	07H	■G	ETB	17H	■W
BS	08H	■H	CAN	18H	■X
HT	09H	■I	EM	19H	■Y
LF	0AH	■J	SUB	1AH	■Z
VT	0BH	■K	ESC	1BH	■A
FF	0CH	■L	FS	1CH	■B
CR	0DH	■M	GS	1DH	■C
SO	0EH	■N	RS	1EH	■D
SI	0FH	■O	US	1FH	■E
			DEL	7FH	■T

## CODE128

This bar code consists of 103 bar code characters and three code sets, enabling 128 ASCII code characters to be printed. It has a variable length of columns.

- Code set A ASCII characters 00H - 5FH can be represented.
- Code set B ASCII characters 20H - 7FH can be represented.
- Code set C Two-digit numbers 00 - 99 can each be represented by one character.  
In addition to the above characters, special characters are available:
- Shift character (SHIFT)  
When used in code set A, one character next to a Shift character is treated as a character of code set B.  
When used in code set B, one character next to a Shift character is treated as a character of code set A.  
The Shift character cannot be used in code set C.
- Code set select characters (CODE A, CODE B, CODE C):  
The code set following a code set select character is switched to code set A, B, or C.
- Function characters (FNC1, FNC2, FNC3, FNC4):  
How the function characters are used depends on each application. In code set C, only FNC1 is available.

When sending print data, note these points:

- (1) Each string of bar code data must begin with a code set select character (CODE A, CODE B, or CODE C), which selects the first code set to use.
- (2) Every special character is specified by a combination of two characters: a brace “{” followed by one character. A brace “{” itself is sent twice consecutively.

### Special characters

Hex.	ASCII	Code Set A	Code Set B	Code Set C
7B53H	{S	SHIFT	SHIFT	-N/A
7B41H	{A	-N/A	CODE A	CODE A
7B42H	{B	CODE B	-N/A	CODE B
7B43H	{C	CODE C	CODE C	-N/A
7B31H	{1	FNC1	FNC1	FNC1
7B32H	{2	FNC2	FNC2	-N/A
7B33H	{3	FNC3	FNC3	-N/A
7B34H	{4	FNC4	FNC4	-N/A
7B7BH	{{	{‘	{‘	{‘

<Example>

To print “No.” in code set B, followed by “123456” in code set C, send the following data string:

```
GS k <73> <10> <7B>H <42>H “No.” <7B>H <43>H <12> <34> <56>
```

### [Sample Program]

```
LPRINT CHR$( &H1D ); “k”; CHR$(73); CHR$(10);  
LPRINT “{BNo.{C”; CHR$(12); CHR$(34); CHR$(56);  
LPRINT CHR$( &HA );  
END
```

- If the printer finds a string of bar code data that does not begin with a code set select character, it immediately aborts the command processing and handles the subsequent data as normal data.
- If the printer received a character that is not available in the currently selected code set, it immediately aborts the command processing and handles the subsequent data as normal data.
- An HRI character corresponding to either a Shift character or a code select character is not printed. An HRI character for either a function character or a control character is treated as a space character.

## GS1 DataBar Omnidirectional

This bar code, consisting of numerals only, has a fixed length of 13 columns.

The minimum height of the bar is 33 times of module size..

(The module size means the minimum width of bar/space that makes up GS1 DataBar. The value is set by GS w n command.)

No check digit is used.

### GS1 DataBar Truncated

The difference from GS1 DataBar Omnidirectional is minimum size of bar height only. The minimum height of the bar is 13 times of module size.

The bar is suitable to print bar in slender space.

No check digit is used.

### GS1 DataBar Limited

This code is the smallest symbology among GS1 DataBar symbologies and the size is minimized by the package indicator (top digits) limited to be "0" or "1". Therefore, the first byte of the data is fixed to "0"(48) or "1"(49).

The minimum height of the bar is 10 times of module size.

No check digit is used.

### GS1 DataBar Expanded

This code covers ISO646(Upper/lower character aphanumeric, space, 20 symbols) and FNC1. Up to 77 digits numerals or up to 41 digits alphabet can be encoded to the bar code.

But following characters are treated as special character to enter special code to the barcode.

{	Escape character
{ (, )	Application identifier
{ *	Automatic check digit embedding

The minimum height of the bar is 34 times of module size.

Escape sequence	Function
{ {	Character "{" is encoded to barcode symbol.
{ (	Character "(" is encoded to barcode symbol.
{ )	Character ")" is encoded to barcode symbol.
{ *	Character "*" is encoded to barcode symbol.
{ 1	FNC1 is encoded to barcode symbol.

20 symbols

[ ! " % & ' ( ) \* + , - . / : ; < = > ? \_ ]

# GS w n

**[Function]** Specifying the horizontal size (magnification) of bar code

**[Code]** <1D>H<77>H<n>

**[Range]**  $2 \leq n \leq 6$

**[Outline]**

- Selecting bar code width.

**[Default]** n=3

**[Sample Program]**

```
LPRINT CHR$(&H1D);"h"; CHR$(30);
LPRINT CHR$(&H1D);"w"; CHR$(2);
GOSUB BC
LPRINT CHR$(&H1D);"h"; CHR$(50);
LPRINT CHR$(&H1D);"w"; CHR$(3);
GOSUB BC
LPRINT CHR$(&H1D);"h"; CHR$(80);
LPRINT CHR$(&H1D);"w"; CHR$(4);
GOSUB BC
END
BC:
LPRINT CHR$(&H1D);"k";
LPRINT CHR$(4);
LPRINT "12"; CHR$(0);
RETURN
```

**[Print Results]**



Height = 30, Magnification = 2

Height = 50, Magnification = 3

Height = 80, Magnification = 4

## 2.2.13 Commands for Non-volatile Memory

# FS p n m

**[Function]** Printing the download NV bit images

**[Code]** <1C>H<70>H<n><m>

**[Range]** 1≤n≤255, 0≤m≤3, 48≤m≤51

**[Outline]**

- This command prints the download NV bit images (n) using a specified mode (m).

m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0, 48	NORMAL MODE	203dpi	203dpi
1, 49	DOUBLE WIDTH MODE	203dpi	101dpi
2, 50	DOUBLE HEIGHT MODE	101dpi	203dpi
3, 51	QUADRUPLE SIZE MODE	101dpi	101dpi

- “n” denotes the number of the download bit image.
- “m” denotes the bit image mode.

**[Caution]**

- When the specified NV bit image “n” is undefined, this command is invalid.
- When the STANDARD MODE is selected, this command is valid only when there is no data in the print buffer.
- This command is invalid when PAGE MODE is selected.
- Any printing modes except the upside-down printing mode (i.e. emphasis, double strike, underlining, character size, inverted character printing, 90°-right-turned) are not affected.
- When the printing area set by the functions GS L and GS W is not enough for one vertical line of the download NV bit image, the line alone is dealt with as follows.  
One vertical line of the bit image is 1 dot in NORMAL MODE (m = 0, 48) and DOUBLE HEIGHT MODE (m = 2, 50), and it is 2 dots in double WIDTH MODE (m = 1, 49) and QUADRUPLE SIZE MODE (m = 3, 51).
  - (1) The printing area is extended to the right side within the limits of the printing area so that one vertical line of the download NV bit image can be printed.
  - (2) When a sufficient printing area cannot be maintained even after executing (1), the printing area is extended to the left side. (The left margin is reduced.)
- When the size of a bit image exceeds the limits of the printing area, the data within the limits of the printing area will be printed but the parts exceeding the limit will not be printed.
- Regardless of the amount of line feed set with ESC 2 and ESC 3, NORMAL MODE and DOUBLE WIDTH MODE execute a paper feed of (height “n” of NV bit image) dots while DOUBLE HEIGHT MODE and QUADRUPLE SIZE MODE execute a paper feed of (height “n” of NV bit image x2) dots.
- At the completion of the bit image printing, the head of the line will be used for the next printing position and normal data processing will take place.

**[See Also]** [ESC\\*](#), [FSg](#), [GS/](#), [GSv0](#)

# FS q n [xL xH yL yH d1...dk] 1... [xL xH yL yH d1...dk] n

**[Function]** Defining the download NV bit image

**[Code]** <1C>H<71>H<n> [<xL><xH><yL><yH><d1...dk>] 1... [<xL><xH><yL><yH><d1...dk>] n

**[Range]**  $1 \leq n \leq 255$ ,  $0 \leq xL \leq 255$   
 $0 \leq xH \leq 3$  but,  $1 \leq (xL + xH \times 256) \leq 1023$   
 $0 \leq yL \leq 255$   
 $0 \leq yH \leq 1$  but,  $1 \leq (yL + yH \times 256) \leq 288$   
 $0 \leq d \leq 255$   
 $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$   
Total definition area = 256K bytes

**[Outline]**

- This command defines the specified NV bit image.
- “n” denotes the number of bit images to be defined.
- xL and xH denote the horizontal size of one NV bit image as  $(xL + xH \times 256) \times 8$  dots.
- yL and yH denote the vertical size of one NV bit image as  $(yL + yH \times 256) \times 8$  dots

**[Caution]**

- Because all the NV bit images previously defined by this command are deleted, it is not possible to redefine any one of the previously defined multiple data. All the data must be resent.
- Any mechanical operation such as opening the cover, initializing the printer head position, or using the paper-feed switch etc can't execute from the execution of this command until the completion of the hardware reset.
- When the STANDARD MODE is selected, this command is only valid when it is written at the head of a line.
- This command is invalid when PAGE MODE is selected.
- This command becomes valid after the 7 bytes of <FS q n xL xH yL yH> are processed as normal values.
- When data which exceeds the remaining capacity of the defined area is specified by xL, xH, yL, yH, outside-defined-area arguments will be processed.
- When outside-defined-area arguments are processed for the first bit image data group, this command becomes invalid.
- If outside-defined-area arguments are processed for the second or subsequent NV bit image data groups, the processing of this command is suspended, and a writing process into the non-volatile memory starts. At this time, the NV bit image being defined becomes invalid (Undefined), but the preceding NV bit images are valid.
- “d” denotes the definition data. Bits which correspond to dots to be printed are represented as “1”, and those not to be printed as “0”.
- The definition will start from NV bit image number 01H and n-number bit images will be defined in ascending order. Therefore, the first data group [xL xH yL yH d1... dk] becomes NV bit image number 01H, and the last data group [xL xH yL yH d1... dk] becomes NV bit image number 0nH. These numbers of NV bit images coincide with those specified with FS p.
- The definition data of one NV bit image consists of [xL xH yL yH d1... dk]. Therefore, when only one NV bit image is defined,  $n = 1$ ; the data group [xL xH yL yH d1... dk] is manipulated once, and  $([Data: (xL + xH \times 256) \times (yL + yH \times 256) \times 8] + [Header: 4])$  bytes of non-volatile memory is used to store it
- The maximum definition area of printer depends on model. Multiple NV bit images can be defined, but bit images of which total size (Bit image data + Header) exceeds capacity of definition area can not be defined.
- The printer state will change to BUSY just before the writing operation into the non-volatile memory begins.
- While this command is being executed, it is not possible to send ASB status or to detect the printer status

even when the ASB function is selected.

- If this command is sent while a macro is still being defined, the definition process will be stopped and the execution of this command will start.
- NV bit images that are defined already are not initialized by using ESC @ command, or by resetting the printer or turning the power off.
- The command only executes definition of NV bit image, but not start printing. The printing of NV bit image will be executed by FS p.
- Because frequent writing in the non-volatile memory can destroy the memory, the writing command should be used less than 10 times a day.
- It may happen that the printer becomes BUSY during the process of writing data into the non-volatile memory in the execution of this command. When the printer becomes BUSY, it will stop receiving data. Therefore, sending data from the host (including real time command) is prohibited.

[See Also]

[FS p, GS\\*](#)

## 2.2.14 Kanji Control Commands

# FS!n

**[Function]** Collectively setting Kanji print mode

**[Code]** <1C>H<21>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- Collectively sets Kanji print mode.
- Each bit of “n” has the following meaning:

Bit	Function	Value	
		0	1
0	Undefined	-	-
1	Undefined	-	-
2	Double-width enlargement	Canceled	Specified
3	Double-height enlargement	Canceled	Specified
4	Undefined	-	-
5	Undefined	-	-
6	Undefined	-	-
7	Underline	Canceled	Specified

**[Caution]**

- Setting both double-height and double-width enlargement causes four times enlargement.
- Underline is applied to all width of printed characters but not to the part skipped by HT. Underline is not applied to the character rotated by 90° clockwise.
- Thickness of underline is the value set by FS – (defaulted to 1 dot width).

**[Default]** n=0

**[See Also]** [FS-](#), [FSW](#), [GS!](#)



# FS &

---

**[Function]** Setting Kanji mode

**[Code]** <1C>H<26>H

**[Outline]**

- Sets Kanji mode.

Japanese Kanji specifications:

This command is invalid when Kanji code system is Shift JIS.

Kanji codes are processed in the order of the first byte and second byte.

This code is defaulted to the state of canceling Kanji mode.

**[Caution]** MSW9-4(japan): Operation of Japanese Kanji specification.

**[See also]** [FS.](#), [FSC](#)

**[Sample Program]**

```
LPRINT CHR$(&H1C);"&";  
LPRINT CHR$(&H34); CHR$(&H41);  
LPRINT CHR$(&H3B); CHR$(&H7A);  
LPRINT CHR$(&HA);  
LPRINT CHR$(&H1C);".";  
LPRINT CHR$(&H34); CHR$(&H41);  
LPRINT CHR$(&H3B); CHR$(&H7A);  
LPRINT CHR$(&HA);
```

**[Print Results]**

漢字 ← When setting Kanji mode  
4A;z ← When canceling Kanji mode

# FS - n

[Function] Setting/canceling Kanji underline

[Code] <1C>H<2D>H<n>

[Range] 0≤n≤2, 48≤n≤50

[Outline]

- Sets or cancels Kanji underline.

n	Function
0, 48	Cancels Kanji underline
1, 49	Sets 1-dot width Kanji underline
2, 50	Sets 2-dot width Kanji underline

[Caution]

- Underline is applied to all width of printed characters but not applied to the part skipped by HT.
- Underline is not applied to the character rotated 90° clockwise.

[See Also] [FS !](#)

[Sample Program]

```
LPRINT CHR$(&H1C);"&";  
LPRINT CHR$(&H1C);"-"; CHR$(0);  
LPRINT CHR$(&H34); CHR$(&H41);  
LPRINT CHR$(&H3B); CHR$(&H7A);  
LPRINT CHR$(&H1C);"-"; CHR$(1);  
LPRINT CHR$(&H34); CHR$(&H41);  
LPRINT CHR$(&H3B); CHR$(&H7A);  
LPRINT CHR$(&HA);  
LPRINT CHR$(&H1C);"-";
```

[Print Results]

Canceling Kanji underline



漢字漢字



Setting Kanji underline

# FS .

---

**[Function]** Canceling Kanji mode

**[Code]** <1C>H<2E>H

**[Outline]**

- Cancels Kanji mode.

Japanese Kanji specifications:

This command is invalid when Kanji code system is Shift JIS.

This code is defaulted to the state of canceling Kanji mode.

**[Caution]** MSW9-4(japan): Operation of Japanese Kanji specification.

**[See Also]** [FS &](#), [FSC](#)

**[Sample Program]**

[Refer to the Sample Program and Printing Results for FS &](#).

# FS 2 a1 a2 [d] k

---

**[Function]** Defining external character

**[Code]** <1C>H<32>H<a1>H<a2>H [<d>] k

**[Range]** Japanese Kanji specifications:

- In case of JIS code system  
a1=<77>H, <21>H<a2<=7E>H
- In case of Shift JIS code system  
a1=<EC>H, <40>H<a2<=7E>H, <80>H<a2<=9E>H

Common

0≤d≤255  
k=72(FONTA: 24×24)  
k=32(FONTC: 16×16)

**[Outline]**

- Defines external Kanji character.
- a1, a2 show Kanji code to define external character and definition of 94 characters are available.
- “d” is data to be defined and the number of data to be defined is 72 bytes of vertical 3 bytes × 24 dots.
- Each data is created by “1” for printed dot and “0” for unprinted dot.

**[Default]**

All are space.

**[Sample Program]**

```
LPRINT CHR$(&H1C);"&";
GOSUB SETCHR
LPRINT CHR$(&H77); CHR$(&H21);
LPRINT CHR$(&HA);
LPRINT CHR$(&H1C);".";
END

SETCHR:
LPRINT CHR$(&H1C);"2";
LPRINT CHR$(&H77); CHR$(&H21);
FOR I=1 TO 72
  READ D
  LPRINT CHR$(D);
NEXT I
RETURN
```

```
DATA&H00, &H00, &H00, &H00, &H00, &H00
DATA&H00, &H00, &H60, &H00, &H00, &HF0
DATA&H00, &H01, &HF8, &H00, &H03, &HFC
DATA&H00, &H07, &HFE, &H00, &H0F, &HFF
DATA&H00, &H00, &HF0, &H00, &H00, &HF0
DATA&H00, &H00, &HF0, &H00, &H00, &HF0
DATA&H00, &H00, &HF0, &H00, &H00, &HF0
DATA&H00, &H01, &HF0, &H1F, &HFF, &HF0
DATA&H1F, &HFF, &HF0, &H1F, &HFF, &HE0
DATA&H1F, &HFF, &HC0, &H00, &H00, &H00
DATA&H00, &H00, &H00, &H00, &H00, &H00
```

**[Print Results]**

└ Registered character  
←

# FS C n

**[Function]** Selecting Kanji code system

**[Code]** <1C>H<43>H<n>

**[Range]**  $0 \leq n \leq 1$ ,  $48 \leq n \leq 49$

**[Outline]** Japanese Kanji specifications:

n	Function
0, 48	Selects JIS code system.
1, 49	Selects Shift JIS code system.

**[Caution]**

- Kanji code valid in JIS code system is 21H to 7EH for both 1st and 2nd bytes.
- Kanji code valid in Shift JIS code system is as follows:
  - 1st byte is 81H to 9FH and E0H to EFH.
  - 2nd byte is 40H to 7EH and 80H to FCH.

Japanese Kanji specifications:

- Codes valid for JIS code system are 21-7Eh(JIS 1 side) and A1H-FEH(JIS 2 side) for both 1<sup>st</sup> & 2<sup>nd</sup> byte.
  - If MSB is not same between 1<sup>st</sup> byte and 2<sup>nd</sup> byte, the address is invalid.

**[Default]** Depend on MSW 9-4.

**[Sample Program]**

```
LPRINT CHR$(&H1C);"&";
LPRINT CHR$(&H1C);"C"; CHR$(0);
LPRINT CHR$(&H34); CHR$(&H41);
LPRINT CHR$(&H3B); CHR$(&H7A);
LPRINT CHR$(&HA);
LPRINT CHR$(&H1C);"C"; CHR$(1);
LPRINT CHR$(&H8A); CHR$(&HBF);
LPRINT CHR$(&H8E); CHR$(&H9A);
LPRINT CHR$(&HA);
LPRINTCHR$(&H1C);";";
```

**[Print Results]**

漢字 ← JIS code system printing  
漢字 ← Shift JIS code system printing

# FS S n1 n2

---

**[Function]** Setting Kanji space amount

**[Code]** <1C>H<53>H<n1><n2>

**[Range]**  $0 \leq n1 \leq 255$   
 $0 \leq n2 \leq 255$

**[Outline]**

- Sets both right and left space amount of Kanji in units of dot.
- Sets left space amount by  $[n1 \times (\text{Basic calculation pitch})]$ .
- Sets right space amount by  $[n2 \times (\text{Basic calculation pitch})]$ .

**[Caution]**

- The right and left space amount in double-width mode are twice the setting.
- Setting independent line feed amount is possible in STANDARD MODE and PAGE MODE.
- Basic calculation pitch is set by GS P. Even if basic calculation pitch is changed by GS P after setting space amount, there is no change in the amount of line feed.  
When fractional number is caused by the calculation, it is corrected by the minimum pitch of mechanism and the rest is discarded.
- In STANDARD MODE, basic calculation pitch (x) in horizontal direction is used.
- In PAGE MODE, the following operation occurs depending on the start point.
  - (1) When the start point is set at "upper left" or "lower right" by ESC T, basic calculation pitch (y) of vertical direction (paper feed direction) is used.
  - (2) When the start point is set at "upper right" or "lower left" by ESC T, basic calculation pitch (x) of horizontal direction (at right angle to paper feed direction) is used.
- The maximum right spacing is capable of approximately 31.906 mm (255/203 inches). A setting greater than this maximum is trimmed to the maximum.

**[Default]** n1=0, n2=0

# FS W n

**[Function]** Setting/canceling four times enlargement of Kanji

**[Code]** <1C>H<57>H<n>

**[Range]** 0≤n≤255

**[Outline]**

- Sets or cancels four times enlargement of Kanji.
- “n” is valid only for the lowest bit (n0).
- Control by the lowest bit (n0) is shown as follows:

n0	Function
0	Cancels 4 times enlargement
1	Sets 4 times enlargement

Setting or canceling 4 times enlargement means setting or canceling both double-height and double-width enlargements simultaneously.

**[See Also]** [FS !](#)

**[Sample Program]**

```
LPRINT CHR$(&H1C);"&";  
LPRINT CHR$(&H1C);"W"; CHR$(0);  
LPRINT CHR$(&H34); CHR$(&H41);  
LPRINT CHR$(&H3B); CHR$(&H7A);  
LPRINT CHR$(&H1C);"W"; CHR$(1);  
LPRINT CHR$(&H34); CHR$(&H41);  
LPRINT CHR$(&H3B); CHR$(&H7A);  
LPRINT CHR$(&HA);  
LPRINT CHR$(&H1C);".";
```

**[Print Results]**

Canceling 4 times enlargement  
↓  
漢字漢字  
↑  
Setting 4 times enlargement



# FS ( A pL pH fn [...]

---

**[Function]** Setting font attribute of Kanji

**[Outline]** Setting Kanji font attribute means execution of processing for Kanji font attribute by the value of "fn" specified.

fn	Function
48	Sets Kanji font

**[Outline]** This command is effective only for the Japanese Kanji specifications.

**fn=48: Function 48 Set Kanji fonts**

# FS ( A pL pH fn m

---

**[Code]** <1C>H<28>H<41>H <pL>< pH>< fn>< m>

**[Range]** (pL+pH×256)÷2 (pL=2, pH=0)  
fn=48  
0≤m≤2, 48≤m≤50

**[Default]** m=0

**[Outline]** Prints the succeeding characters with energy set for "m".  
This command is effective only for the Japanese Kanji specifications.

m	Function
0, 48	Kanji font A(24×24)
1, 49	invalid
2, 50	Kanji font C(16×16)

## 2.2.16 Printer Function Setting Commands

# GS ( E pL pH fn [...]

**[Function]** Printer function setting command

**[Outline]**

- Printer function setting command is a command to change the function of the printer stored on the non-volatile memory and executes the function set by the value of “fn”.

Function No. (fn)	Function
<a href="#">Function 1</a>	Transfers to printer function setting mode.
<a href="#">Function 2</a>	Terminates printer function setting mode.
<a href="#">Function 3</a>	Sets memory switch value.
<a href="#">Function 4</a>	Sends memory switch value set.
<a href="#">Function 5</a>	Sets customize value.
<a href="#">Function 6</a>	Sends customized value set.
<a href="#">Function 7</a>	Copies user-defined page.
<a href="#">Function 8</a>	Defines the data in column format to the character code page of work area.
<a href="#">Function 9</a>	Defines the data in raster format to the character code page of work area.
<a href="#">Function 10</a>	Erases the data of character code page of work area.
<a href="#">Function 11</a>	Sets the communication condition of serial interface. (Note)
<a href="#">Function 12</a>	Sends the communication condition of serial interface set.
<a href="#">Function 103</a>	Set the printable area width.
<a href="#">Function 104</a>	Send the printable area width.
<a href="#">Function 255</a>	Sets all contents set in printer function setting mode to the state at the time of shipment.

- pL, pH set the number of bytes following “fn” to (pL + pH×□256).
- At the end of printer function setting mode (Function 2), resetting is executed. Then the input buffer is cleared to return various kinds of setting to the state at the time of power on.
- The set value can be confirmed without transferring to printer function setting mode by functions 4, 6, 12 and 102.
- Other functions do not operate without transferring to printer function setting mode.

**[Caution]**

- This command allows writing to non-volatile memory. Therefore, using this command frequently may result in breakage of memory. Use this command appropriately [10 times max./day].
- During execution of this command, the printer is in Busy state and stops receiving operation. Therefore, data transmission from the host is prohibited.

## fn=1: Function 1 Transferring to Printer Function Setting Mode

# GS ( E pL pH fn d1 d2

---

[Code] <1D>H<28>H<45>H <pL><pH><fn><d1><d2>

[Range] (pL+pH×256)=3 (pL=3, pH=0)  
fn=1  
d1=73 ("I")  
d2=78 ("N")

### [Outline]

- Transfers to printer function setting mode and sends the report of mode transfer.

	Hex.	No. of Data
Header	37H	1
ID	20H	1
NULL	00H	1

## fn=2: Function 2 End of Printer Function Setting Mode

# GS ( E pL pH fn d1 d2 d3

---

[Code] <1D>H<28>H<45>H <pL><pH><fn><d1><d2><d3>

[Range] (pL+pH×256)=4 (pL=4, pH=0)  
fn=2  
d1=79 ("O")  
d2=85 ("U")  
d3=84 ("T")

### [Outline]

- Terminates printer function setting mode and executes resetting.
- Clears input buffer and print buffer and restores various kinds of setting to the state at power on.
- Operates only in printer function setting mode.

### fn=3: Function 3 Setting Memory Switch Value

## GS ( E pL pH fn [a1 b18...b11] ... [ak bk8...bk1]

---

**[Code]** <D>H<28>H<45>H<pL><pH><fn> [<a1><b18>...<b11>] ... [<ak><bk8>...<bk1>]

**[Range]**  $10 \leq (pL + pH \times 256) \leq 65535$   
fn=3  
b=48, 49, 50  
a=1, 2, 3, 4, 5, 6

**[Outline]**

- Changes the MSW set in a to the value set in “b”.

B	Function
48	Sets corresponding bit to OFF.
49	Sets corresponding bit to ON.
50	Does not change corresponding bit.

**[Caution]** • MSW7 to MSW10 cannot be changed by this command. They can be changed by the setting of customize value.

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• Setting MSW 1 (a=1)

n	b (Set Value)	Function
1	48 (Default)	Reports the power on.
	49	Does not report power on.
2	48 (Default)	Sets input buffer capacity to 4K bytes.
	49	Sets input buffer capacity to 45 bytes. (Note)
3	48 (Default)	Sets input buffer full and offline to be Busy.
	49	Sets to be busy with input buffer full.
4	48 (Default)	At the occurrence of receiving error, replaces the data with "?".
	49	At the occurrence of receiving error, ignores the data.
5	48 (Default)	Disables CR (ODH).
	49	Enables CR (ODH).
6	48 (Default)	Reserved
7	48 (Default)	Does not reset at serial I/F pin 6.
	49	Resets at serial I/F pin 6.
8	48 (Default)	Reserved

• Setting MSW 2 (a=2)

n	b (Set Value)	Function
1	49 (Default)	Reserved
2	48	Disables auto cutter.
	49 (Default)	Enables auto cutter.
3	48 (Default)	Enables stored printing.
	49	Disables stored printing.
4	48 (Default)	Immediately after digit reaches full, line-feed is taken.
	49	Immediately after digit reaches full, data wait is taken.
5	48 (Default)	After head-down* and PE recovery, prints as it is.
	49	After head-down* and PE recovery, prints from the beginning using PAGE MODE, barcode, image, double-height printing, etc. as a unit.
6	48	Sets paper width to 80 mm.
	49	Sets paper width to 58(60) mm.
7	48 (Default)	Reserved
8	48	Enables PNE.
	49 (Default)	Disables PNE.

• Setting MSW 3 (a=3)

n	b (Set Value)	Function
1	48 (Default)	After clearing cutter error, can be restored by Feed SW.
	49	After clearing cutter error, cannot be restored by Feed SW.
2	48 (Default)	Reserved
3	48 (Default)	Resets with parallel pin 31.
	49	Does not reset with parallel pin 31.
4	48 (Default)	Uses thermal paper.
	49	Uses Black mark paper.
5	48 (Default)	Used with 48 print columns
	49	Used with 32 print columns.
6	48 (Default)	Reserved
7	48 (Default)	Sets EPSON compatible mode.
	49	Sets CBM1000-compatible mode.
8	48 (Default)	Sets platen-open error during printing to be auto recovery error.
	49	Sets platen-open error during printing to be recoverable error.

• Setting MSW 4 (a=4)

n	b (Set Value)	Function
1	48	Reserved
	49	Reserved
2	48	Reserved
	49 (Default)	Reserved

3	48	Paper heading cut disabled.
	49 (Default)	Paper heading cut enabled.
4	48	Reserved
	49	Reserved
5	48	Reserved
	49	Reserved
6	48	Reserved
7	48	Reserved
8	48(Default)	Forcible partial cut disabled.
	49	Forcible partial cut enabled (full cut by command: enabled).

\* MSW 4-1, -2 are valid when MSW 3-4 is ON.

• Setting MSW 5 (a=5)

<b>n</b>	<b>b (Set Value)</b>	<b>Function</b>
1	48 (Default)	Reserved
2	48 (Default)	Reserved
3	48	Reserved
	49	Reserved
4	48 (Default)	Reserved
5	48 (Default)	Reserved
6	48	Priority of the print speed.
	49 (Default)	It is priority of the print quality.
7	48 (Default)	Reserved
8	48 (Default)	Reserved

## fn=4: Function 4 Sending the Set Memory Switch Value

# GS ( E pL pH fn a

---

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><a>

**[Range]** (pL+pH×256)÷2  
fn=4  
a=1, 2, 3, 4, 5

**[Outline]**

- Sends the content of MSW set in “a”.

	Hex.	No. of Data
Header	37H	1
ID	21H	1
Data	30H or 31H	8
NULL	00H	1

- Sends the set value of data in 8-byte data raw in order of bits 8, 7, 6  
OFF: 30H (“0”)  
ON: 31H (“1”)

**[Caution]**

- MSW7 to MSW10 cannot be sent by this command.
- Transmission is available by <Sending preset customize value>.

fn=5: Function 5 Setting Customized Value

# GS ( E pL pH fn [a1 n1L n1H] ... [ak nkL nkH]

[Code] <1D>H<28>H<45>H<pL><pH><fn> [<a1><n1L><n1H>] ... [<ak><nkL><nkH>]

[Range] 4≤(pL+pH×256)≤65535  
 fn=5  
 1≤(nL+nH×256)≤65535  
 a=5, 6, 213, 214, 216, 217, 218, 249

[Outline] • Sets the customized value set in “a” to (nL+nH×256).

a	Function
1	Specifies user NV memory capacity.
2	Specifies the memory capacity of NV graphics.
3	Selects paper width.
5	Selects printing density.
6	Selects printing speed.
97	Sets the number of divisions for conducting head
116	Selects printing color.
138	Control of bezel LED
151	Select Security / Connect Device
155	Search of BT device
156	Auto reconnection request
190	Selects the Error LED states for Bluetooth status
201	Sets ACK output position (only parallel I/F).
202	Selects input buffer full Busy output/cancel timing (idle capacity).
212	Selects DMA (Direct Memory Access) control of serial communication.
213	Selects the flow control when virtual COM is set.
214	Select the enable/disable of Kanji.
216	Selects JIS / Shift JIS or Kanji Code
217	Selects the international character set
218	Selects the code page
220	Sets BM width.
221	Sets BM page length.
222	Adjusts the BM sensor and distance between header.
223	Adjusts the distance of BM footer.
224	Adjusts the distance of BM header.
225	Adjusts the BM width and the extreme breath of the distance between label.
226	Sets the wait time for manual cut
227	Sets the maximum length measurement distance.
228	Sets the after an auto cut movement.
229	Sets the manual cut position movement.
230	Selects the language of LCD message
231	Selects the enable/disable of LCD download message
232	Selects the LCD auto Off time
233	Selects the enable/disable of key lock
234	Selects the direction of LCD message
235	Sets the distance between labels.
236	Sets the label length.
237	Sets the label sensor and distance between header.
238	Adjusts the distance of the label footer.
239	Adjusts the distance of the label header.
240	Sets the buzzer Sound
241	Sets the max dot number for one head division
242	Sets the max dot number for Powered USB



243	Select the mechanism type
244	Select the top margin
245	Select the line gap reduction rate
246	Select the vertical/horizontal character size reduction percentage
247	Selects the number of dot for vertical shift
248	Selects the event to activate buzzer
249	Selects the emulation
251	Selects the liner free mode setting

**[Caution]**

- This function operates only in printer function setting mode.
- The value changed by this command is enabled by execution of function 2 (fn = 2: End of printer function setting mode) (Recommended)

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- a=5: Sets printing density to the level specified by (nL+nH×256).

(nL+nH×256)	Printing Density
65530	70%
65531	75%
65532	80%
65533	85%
65534	90%
65535	95%
0(Default)	100%
1	105%
2	110%
3	115%
4	120%
5	125%
6	130%
7	135%
8	140%

- a=6: Sets printing speed to the value specified by (nL+nH×256).

(nL+nH×256)	Printing Speed
1	Printing speed level 1 (min)
2	Printing speed level 2
3	Printing speed level 3
4	Printing speed level 4
5	Printing speed level 5
6	Printing speed level 6
7	Printing speed level 7
8	Printing speed level 8
9 (Default)	Printing speed level 9 (max)

- a=213: Selects the flow control specified by (nL+nH×256) when virtual COM is set.

(nL+nH×256)	Flow control
1(Default)	PC setting
2	DTR/DSR
3	XON/XOFF

- a=214: Select the enable/disable of Kanji specified by (nL+nH×256)

(nL+nH×256)	Kanji
1	Invalid(OFF)
2(Default)	Valid(ON)

- a=216: Select the JIS/Shift JIS specified by (nL+nH×256)

(nL+nH×256)	JIS/Shift JIS
1(Default)	JIS (ON)
2	Shift JIS(OFF)

- a=217: Select the international character set specified by (nL+nH×256)

(nL+nH×256)	Int'l Char set	(nL+nH×256)	Int'l Char set
1(Default)	U.S.A.	9	Japan
2	France	10	Norway
3	Germany	11	Denmark II
4	U.K.	12	Spain II
5	Denmark I	13	Latin America
6	Sweden	14	Korea
7	Italy	15	Croatia
8	Spain I	16	P.R. China

• a=218: Select the codepage specified by (nL+nH×256)

(nL+nH×256)	Codepage	(nL+nH×256)	Codepage
1(Default)	Codepage PC437	11	Space page
2	katakana	12	Codepage PC864
3	Codepage PC850	13	ThaiCode18 3Pass
4	Codepage PC860	14	TCVN3
5	Codepage PC863	15	TCVN3 Caps
6	Codepage PC865		
7	Codepage PC852		
8	Codepage PC866		
9	Codepage PC857	19	WPC1258
10	WPC1252		

• a=249: Select the emulation specified by (nL+nH×256)

(nL+nH×256)	Emulation
1(Default)	ESC/POS
2	Axiohm1
3	Axiohm2

## fn=6: Function 6 Sending the Set Customized Value

# GS ( E pL pH fn a

[Code] <1D>H<28>H<45>H<pL><pH><fn><a>

[Range] (pL+pH×256)=2 (pL=2, pH=0)  
fn=6  
a=5, 6, 213, 214, 216, 217, 218, 249

[Outline]

- Sends the set value of customized value set by "a".

	Hex.	No. of Data
Header	37H	1
ID	27H	1
Customized value No.	30H to 39H	1 to 3
Separation number	1FH	1
Customized value	30H to 39H	1 to 5
NULL	00H	1

- Configuration of customized value No.

a	Sending Data		
	1st Byte	2nd Byte	3rd Byte
1	49("1")	-	-
2	50("2")	-	-
3	51("3")	-	-
5	53("5")	-	-
6	54("6")	-	-
97	57("9")	55("7")	-
116	49("1")	49("1")	54("6")
138	49("1")	51("3")	56("8")
151	49("1")	53("5")	49("1")
155	49("1")	53("5")	53("5")
156	49("1")	53("5")	54("6")
201	50("2")	48("0")	49("1")
202	50("2")	48("0")	50("2")
212	50("2")	49("1")	50("2")
213	50("2")	49("1")	51("3")
214	50("2")	49("1")	52("4")
216	50("2")	49("1")	54("6")
217	50("2")	49("1")	55("7")
218	50("2")	49("1")	56("8")
220	50("2")	50("2")	48("0")
221	50("2")	50("2")	49("1")
222	50("2")	50("2")	50("2")
223	50("2")	50("2")	51("3")
224	50("2")	50("2")	52("4")
225	50("2")	50("2")	53("5")
226	50("2")	50("2")	54("6")
227	50("2")	50("2")	55("7")
228	50("2")	50("2")	56("8")
229	50("2")	50("2")	57("9")
230	50("2")	51("3")	48("0")
231	50("2")	51("3")	49("1")
232	50("2")	51("3")	50("2")

233	50("2")	51("3")	51("3")
234	50("2")	51("3")	52("4")
235	50("2")	51("3")	53("5")
236	50("2")	51("3")	54("6")
237	50("2")	51("3")	55("7")
238	50("2")	51("3")	56("8")
239	50("2")	51("3")	57("9")
240	50("2")	52("4")	48("0")
241	50("2")	52("4")	49("1")
242	50("2")	52("4")	50("2")
243	50("2")	52("4")	51("3")
244	50("2")	52("4")	52("4")
245	50("2")	52("4")	53("5")
246	50("2")	52("4")	54("6")
247	50("2")	52("4")	55("7")
248	50("2")	52("4")	56("8")
249	50("2")	52("4")	57("9")
251	50("2")	53("5")	49("1")

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• a=5: When print density is specified

Setting Status		Sending Data				
Stored Value	Print Density	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
65530	70%	54("6")	53("5")	53("5")	51("3")	48("0")
65531	75%	54("6")	53("5")	53("5")	51("3")	49("1")
65532	80%	54("6")	53("5")	53("5")	51("3")	50("2")
65533	85%	54("6")	53("5")	53("5")	51("3")	51("3")
65534	90%	54("6")	53("5")	53("5")	51("3")	52("4")
65535	95%	54("6")	53("5")	53("5")	51("3")	53("5")
0	Basic density	48("0")	-	-	-	-
1	105%	49("1")	-	-	-	-
2	110%	50("2")	-	-	-	-
3	115%	51("3")	-	-	-	-
4	120%	52("4")	-	-	-	-
5	125%	53("5")	-	-	-	-
6	130%	54("6")	-	-	-	-
7	135%	55("7")	-	-	-	-
8	140%	56("8")	-	-	-	-

• a=6: When printing speed is specified

Setting Status		Sending Data				
Stored Value	Print Speed	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
1	Speed level 1	49("1")	-	-	-	-
2	Speed level 2	50("2")	-	-	-	-
3	Speed level 3	51("3")	-	-	-	-
4	Speed level 4	52("4")	-	-	-	-
5	Speed level 5	53("5")	-	-	-	-
6	Speed level 6	54("6")	-	-	-	-
7	Speed level 7	55("7")	-	-	-	-
8	Speed level 8	56("8")	-	-	-	-
9	Speed level 9	57("9")	-	-	-	-

• a=213: When the flow control of virtual COM is specified.

Setting Status		Sending Data				
----------------	--	--------------	--	--	--	--

Stored Value	Flow control	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
1	PC setting	49("1")	-	-	-	-
2	DTR/DSR	50("2")	-	-	-	-
3	XON/XOF	51("3")	-	-	-	-

• a=214: When Kanji is specified

Setting Status		Sending Data				
Stored Value	Kanji	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
1	OFF	49("1")	-	-	-	-
2	ON	50("2")	-	-	-	-

• a=216: When JIS/Shift JIS is specified

Setting Status		Sending Data				
Stored Value	JIS/Shift JIS	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
1	JIS	49("1")	-	-	-	-
2	Shift JIS	50("2")	-	-	-	-

•a=217: When international character set is specified

Setting Status		Sending Data				
Stored Value	Int'l char. set	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
1	U.S.A.	49("1")	-	-	-	-
2	France	50("2")	-	-	-	-
3	Germany	51("3")	-	-	-	-
4	U.K.	52("4")	-	-	-	-
5	Denmark I	53("5")	-	-	-	-
6	Sweden	54("6")	-	-	-	-
7	Italy	55("7")	-	-	-	-
8	Spain I	56("8")	-	-	-	-
9	Japan	57("9")	-	-	-	-
10	Norway	49("1")	48("0")	-	-	-
11	Denmark II	49("1")	49("1")	-	-	-
12	Spain II	49("1")	50("2")	-	-	-
13	Latin America	49("1")	51("3")	-	-	-
14	Korea	49("1")	52("4")	-	-	-
15	Croatia	49("1")	53("5")	-	-	-
16	P.R.China	49("1")	54("6")	-	-	-

Value						
1	Codepage PC437	49("1")	-	-	-	-
2	Katakana	50("2")	-	-	-	-
3	Codepage PC850	51("3")	-	-	-	-
4	Codepage PC860	52("4")	-	-	-	-
5	Codepage PC863	53("5")	-	-	-	-
6	Codepage PC865	54("6")	-	-	-	-
7	Codepage PC852	55("7")	-	-	-	-
8	Codepage PC866	56("8")	-	-	-	-
9	Codepage PC857	57("9")	-	-	-	-
10	WPC1252	49("1")	48("0")	-	-	-
11	Space page	49("1")	49("1")	-	-	-
12	Codepage PC864	49("1")	50("2")	-	-	-
13	Thaicode18	49("1")	51("3")	-	-	-

•a=249: Emulation is specified.

Setting Status		Sending Data				
Stored Value	Emulation	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte
1	ESC/POS	49("1")	-	-	-	-
2	Axiohm1	50("2")	-	-	-	-
3	Axiohm2	51("3")	-	-	-	-

•a=218: When codepage is specified

Setting Status		Sending Data				
Stored	Codepage	1st Byte	2nd Byte	3rd Byte	4th Byte	5th Byte

## GS ( E pL pH fn a d1 d2

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><a><d1><d2>

**[Range]** (pL+pH×256)=4 (pL=4, pH=0)  
fn=7  
a=10, 12, 17

**[Outline]**

- Copies the data of user-defined code page in the font specified by “a”.
- Configuration of customized value No.

d1	d2	Function
31	30	Loads the character code page data specified by “a” in storage area to work area.
30	31	Saves the character code page data in work area to the storage area of the font specified by “a”.

- Work area: Area where data is initialized by power OFF or resetting (initialize).  
Operation is made in accordance with the data set in this area.
- Storage area: Area where data is not initialized by power OFF or resetting (initialize).
- User-defined code page: Page 255 (ESC t 255)
- This function operates only in printer function setting mode.

a	Font Type
10	Font B: 9 (horizontal)×17 (vertical)
12	Font A: 12 (horizontal)×24 (vertical)
17	Font C: 8 (horizontal)×16 (vertical)



fn=8: Function 8 Defining Data by the Column Format to Character Code Page of Work Area

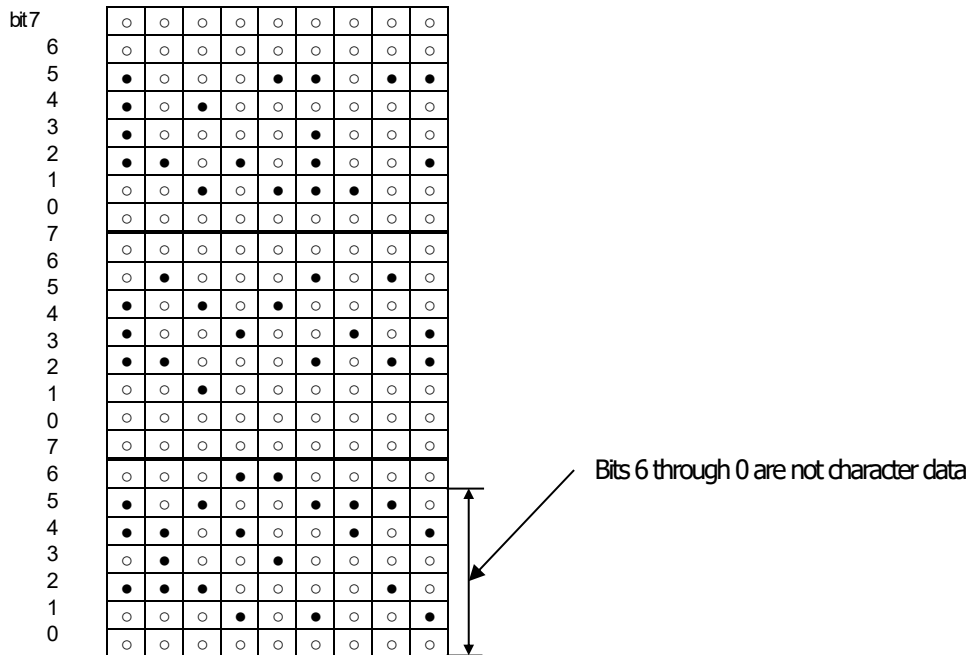
# GS ( E pL pH fn y c1 c2 [xd1...d(y×x)] k

[Code] <1D>H<28>H<45>H<pL><pH><fn><y><c1><c2> [<x><d1>..<<d(y×x)>] <k>

[Range] 5≤(pL+pH×256)≤65535  
 fn=8  
 y=2 (At selection of font C)  
 y=3 (At selection of other than font C)  
 128≤c1≤c2≤255  
 0≤x≤12 (At selection of font A)  
 0≤x≤9 (At selection of font B)  
 0≤x≤8 (At selection of font C)  
 0≤d≤255  
 k=c2-c1+1

- [Outline]
- Defines the data in column format in units of character on the code page in RAM.
  - Operates only in printer function setting mode.

Data structure(9×17)  
 d1 d4 ..... d25  
 d3 d6 ..... d27



fn=9: Function 9 Defining Data in the Raster Format to the Character Code Page of Work Area

# GS ( E pL pH fn x c1 c2 [y d1...d(x\*y)] k

[Code] <1D>H<28>H<45>H<pL><pH><fn><x><c1><c2> [<y><d1>..

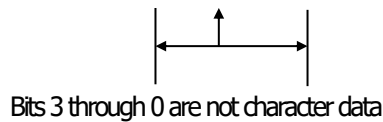
[Range] 5≤(pL+pH×256)≤65535  
 fn=9  
 x=1 (At selection of font C), x=2 (At selection of other than font C)  
 128≤c1≤c2≤255  
 0≤y≤24 (At selection of font A)  
 0≤y≤16 (At selection of font C), 0≤d≤255  
 k=c2-c1+1  
 0≤x≤17 (At selection of font B)

[Outline]

- Defines the data in raster format in units of character on the character code page in work area.
- Operates only in printer function setting mode.

Data structure(12×24)

	d1 (odd number)								d2 (even number)							
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
d1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
7	●	○	○	○	●	●	○	●	●	○	○	○	○	○	○	○
9	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○
11	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
13	●	●	○	●	○	●	○	○	○	○	○	○	○	○	○	○
15	○	○	●	○	●	●	○	○	○	○	○	○	○	○	○	○
17	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
19	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
21	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
23	●	○	●	○	●	○	○	○	○	○	○	○	○	○	○	○
25	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
27	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○
29	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○
31	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
33	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
35	○	○	○	●	●	○	○	○	○	○	○	○	○	○	○	○
37	●	○	●	○	○	●	●	○	○	○	○	○	○	○	○	○
39	●	●	○	●	○	○	○	○	○	○	○	○	○	○	○	○
41	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
43	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○
45	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
47	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



fn=10: Function 10 Erasing Data of Character Code Page Data in Work Area

# GS ( E pL pH fn c1 c2

---

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><c1><c2>

**[Range]** (pL+pH×256)÷3  
fn=10  
128≤c1≤c2≤255

**[Outline]**

- Erases (set to space) data in units of character on the character code page in work area.
- Operates only in printer function setting mode.

fn=11: Function 11 Setting Communication Conditions

# GS ( E pL pH fn a d1...dk

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><a><d1>...<dk>

**[Range]**  $3 \leq (pL + pH \times 256) \leq 65535$  ( $0 \leq pL \leq 255$ ,  $0 \leq pH \leq 255$ )  
 fn=11  
 $1 \leq a \leq 4$  (Not changed in other than specified range)  
 $48 \leq d \leq 57$  (Not changed in other than specified range)  
 $1 \leq k \leq 6$

**[Outline]**

- Sets the communication conditions of serial interface specified by "a".
- a=1: Setting baud rate

Baud Rate	d1	d2	d3	d4	d5	d6
1200	49("1")	50("2")	48("0")	48("0")		
2400	50("2")	52("4")	48("0")	48("0")	-	-
4800	52("4")	56("8")	48("0")	48("0")	-	-
▲9600	57("9")	54("6")	48("0")	48("0")	-	-
19200	49("1")	57("9")	50("2")	48("0")	48("0")	-
38400	51("3")	56("8")	52("4")	48("0")	48("0")	-
57600	53("5")	55("7")	54("6")	48("0")	48("0")	-
115200	49("1")	49("1")	53("5")	50("2")	48("0")	48("0")

▲—Default

- a=2: Setting to specified parity

d1	Parity Setting
48 (Default)	No parity
49	Odd parity
50	Even parity

- a=3: Setting to specified flow control

d1	Flow Control
48 (Default)	DSR/DTR
49	XON/XOFF

- a=4: Setting to specified data length

d1	Setting Data Length
55	7-bit length
56 (Default)	8-bit length

- Operates only in printer function setting mode.
- Which of dip SW or memory SW is used at initialization depends on "Selecting communication condition setting" of dip SW1-1.

## fn=12: Function 12 Sending the Set Communication Conditions

# GS ( E pL pH fn a

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><a>

**[Range]** (pL+pH×256)÷2 (pL=2, pH=0)  
 fn=12  
 1≤a≤4 (Does not send in other than specified range)

**[Outline]**

- Sends communication conditions of serial interface specified by “a”.

	Hex.	No. of Data
Header	37H	1
ID	33H	1
Kind of communication conditions (a)	31H("1") to 34H("4")	1
Separation number	1FH	1
Set value	30H to 39H	1 to 6
NULL	00H	1

• **Set value**

a=1: At specification of baud rate

Baud Rate	d1	d2	d3	d4	D5	d6
1200	49("1")	50("2")	48("0")	48("0")		
2400	50("2")	52("4")	48("0")	48("0")	-	-
4800	52("4")	56("8")	48("0")	48("0")	-	-
9600	57("9")	54("6")	48("0")	48("0")	-	-
19200	49("1")	57("9")	50("2")	48("0")	48("0")	-
38400	51("3")	56("8")	52("4")	48("0")	48("0")	-
57600	53("5")	55("7")	54("6")	48("0")	48("0")	-
115200	49("1")	49("1")	53("5")	50("2")	48("0")	48("0")

a=2: At specification of parity

d1	Parity Setting
48	No parity
49	Odd parity
50	Even parity

a=3: At specification of flow control

d1	Flow Control
48	DTR/DSR
49	XON/XOFF

a=4: At specification of data length

d1	Setting Data Length
48	7-bit length
49	8-bit length

fn=103: Function 103 Set the printable area width

## GS ( E pL pH fn nL nH

---

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><nL><nH>

**[Range]** pL = 3  
pH = 0  
fn = 103  
 $0 \leq nL \leq 255$   
 $0 \leq nH \leq 3$   
 $96 \leq nL + nH \times 256 \leq 832$  (a multiple of 8)  
Note: If a multiple of other than 8 is specified, then this will be replaced with the multiple of 8 closest to the specified value.  
(For example: If 457 is specified, then this will be replaced with 464)

**[Default]**  $(nL + nH \times 256) = 832$  (nL = 64, nH = 3)

**[Function]** Specifies the print area width specified with nL and nH using dot units.

**[Caution]**

- If MSW8-1 is set to "user-defined", then the printable area width will be enabled using this command.
- Use this command to set the value corresponding to the width of the media set in the media holder to <nL><nH>.
- If the printable area width is set in GS ( z PrintWid, then this setting will take priority.
- This only functions in the printer function setting mode.

fn=104: Function 104 Send the printable area width

## GS ( E pL pH fn

---

**[Code]** <1D>H<28>H<45>H<pL><pH><fn>

**[Range]** pL = 1  
pH = 0  
fn = 104

**[Function]** Sends the printable area width specified with nL and nH using print dot units.

	Hexadecimal	Data length
Header	37H	1
ID	68H	1
Fixed	31H	1
Division number	1FH	1
Printable area width (96 to 832)	30H to 39H	2 or 3
NULL	00H	1

**fn=255: Function 255 Setting All Contents Set by Printer Function Setting Mode to the State at Shipment**

# GS ( E pL pH fn a

---

**[Code]** <1D>H<28>H<45>H<pL><pH><fn><a>

**[Range]** (pL+pH×256)÷2  
fn=255  
a=3, 5, 11, 255

**[Outline]**

- Restores various kinds of function set by printer function setting mode to the setting at the time of shipment (initial value described in User's Manual).

<b>a</b>	<b>Function</b>
3	Memory switch
5	Customized value
7	Character code
11	Communication conditions of serial interface
255	Sets all contents set in printer function setting mode to the state at the time of shipment.



# GS ( K pL pH fn m

---

**[Function]**      Selecting print control method

**[Outline]**

Executes the setting related to the print control specified by the value of "fn".

<b>Function No. (fn)</b>	<b>Function</b>
<a href="#">Function 49</a>	Sets printing density.
<a href="#">Function 50</a>	Sets printing speed.

fn=49: Function 49 Setting Printing Density

# GS ( K pL pH fn m

**[Code]** <1D>H<28>H<4B>H<pL><pH><fn><m>

**[Range]** (pL+pH×256)÷2 (pL=2, pH=0)  
fn=49  
0≤m≤8, 250≤m≤255

**[Default]** m=0 (Customized value setting value)

**[Outline]**

- Sets printing density.

m	Printing Density
250	Selects density level -6 (70%)
251	Selects density level -5 (75%)
252	Selects density level -4 (80%)
253	Selects density level -3 (85%)
254	Selects density level -2 (90%)
255	Selects density level -1 (95%)
0	Selects standard density (100%)
1	Selects density level + 1 (105%)
2	Selects density level + 2 (110%)
3	Selects density level + 3 (115%)
4	Selects density level + 4 (120%)
5	Selects density level + 5 (125%)
6	Selects density level + 6 (130%)
7	Selects density level + 7 (135%)
8	Selects density level + 8 (140%)

## fn=50: Function 50 Setting Printing Speed

# GS ( K pL pH fn m

---

[Code] <1D>H<28>H<4B>H<pL><pH><fn><m>

[Range] (pL+pH×256)=2 (pL=2, pH=0)  
fn=50  
0≤m≤9, 48≤m≤57

[Default] m=0 (Customized value setting)

[Outline]

- Sets printing speed.

m	Printing Speed
0, 48	Selects customized value setting
1, 49	Selects printing speed level 1.
2, 50	Selects printing speed level 2.
3, 51	Selects printing speed level 3.
4, 52	Selects printing speed level 4.
5, 53	Selects printing speed level 5.
6, 54	Selects printing speed level 6.
7, 55	Selects printing speed level 7.
8, 56	Selects printing speed level 8.
9, 57	Selects printing speed level 9.

2.2.17 2-dimensional code Commands

# GS ( k pL pH cn fn [parameter]

**[Function]**      Setting and printing 2-dimensional code

**[Outline]**

- Executes processing specified by function code (fn) with the 2-dimensional code specified by cn.
- 2-dimensional codes selectable with the value of cn are shown below.

cn	2-dimensional code
48	PDF417
49	QRCode

- Executes various processing related to 2-dimensional code specified by fn.

cn	fn	Code	Function No.	Function
48	65	GS ( k pL pH cn fn n	<a href="#">Function65</a>	Sets the number of digits of PDF417.
	66	GS ( k pL pH cn fn n	<a href="#">Function66</a>	Sets the number of steps of PDF417.
	67	GS ( k pL pH cn fn n	<a href="#">Function67</a>	Sets the module width of PDF417.
	68	GS ( k pL pH cn fn n	<a href="#">Function68</a>	Sets the height of the step of PDF417.
	69	GS ( k pL pH cn fn m n	<a href="#">Function69</a>	Sets error correction level of PDF417.
	70	GS ( k pL pH cn fn m	<a href="#">Function70</a>	Sets the option of PDF417.
	80	GS ( k pL pH cn fn m d1 ... dk	<a href="#">Function80</a>	Stores received PDF417 data to 2-dimensional code data storage area *.
81	GS ( k pL pH cn fn m	<a href="#">Function81</a>	Prints PDF417 data* of 2-dimensional code data storage area.	

cn	fn	Code	Function No.	Function
49	65	GS ( k pL pH cn fn n1 n2	<a href="#">Function165</a>	Specifies QRCode model.
	67	GS ( k pL pH cn fn n	<a href="#">Function167</a>	Sets the size of QRCode module.
	69	GS ( k pL pH cn fn n	<a href="#">Function169</a>	Sets error correction level of QRCode.
	80	GS ( k pL pH cn fn m d1 ... dk	<a href="#">Function180</a>	Stores received QRCode data to 2-dimensional code data storage area.
	81	GS ( k pL pH cn fn m	<a href="#">Function181</a>	Prints QRCode data in 2-dimensional code data storage area.

\* PDF417 data ...                      Indicates data (d1 ... dk) of [cn=48: Function 80] .

\* 2-dimensional code data storage area ... Indicates the area where [cn=48: Function 80] , [cn=49: Function 180] , and [cn=51: Function 380] data are stored.

\* QRCode data ...                      Indicates data (d1 ... dk) of [cn=49: Function 180] .

## fn=65: Function 65 Setting the number of digits of PDF417

# GS ( k pL pH cn fn n

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><n>

[Range] (pL+pH×256)÷3 (pL=3, pH=0)  
cn=48  
fn=65  
0≤n≤30

### [Outline]

- Sets the number of digits of PDF417.
- With n=0, automatic processing is specified.
  - \* For the number of digits in this case, the number of code words is calculated based on current print area.
- With n≠0, the number of digits of PDF417 data area is designated to n code word.

### [Caution]

- Start pattern and stop pattern are not included in the number of digits.
- Left-step indicator code word and right-step indicator code word are not included in the number of digits.

[Default] n=0

## fn=66: Function 66 Setting the number of steps of PDF417

# GS ( k pL pH cn fn n

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><n>

[Range] (pL+pH×256)÷3 (pL=3, pH=0)  
cn=48  
fn=66  
n=0, 3≤n≤90

### [Outline]

- Sets the number of steps of PDF417.
- With n=0, automatic processing is specified.
  - \* The number of steps in this case is calculated based on the number of code words and current print area.
- With n≠0, the number of steps of PDF417 is set to n steps.

[Default] n=0

fn=67: Function 67 Setting module width of PDF417

## GS ( k pL pH cn fn n

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><n>

[Range] (pL+pH×256)=3 (pL=3, pH=0)  
cn=48  
fn=67  
2≤n≤8

[Outline] •Sets the width of one module of PDF417 to n dots.

[Default] n=3

fn=68: Function 68 Setting the height of step of PDF417

## GS ( k pL pH cn fn n

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><n>

[Range] (pL+pH×256)=3 (pL=3, pH=0)  
cn=48  
fn=68  
2≤n≤8

[Outline] •Sets the height of the step of PDF417 to [Module width (Function 67) x n] .

[Default] n=3

fn=69: Function 69 Setting error correction level of PDF417

# GS ( k pL pH cn fn m n

**[Code]** <1D>H<28>H<6B>H<pL><pH><cn><fn><m><n>

**[Range]** (pL+pH×256)=4 (pL=4, pH=0)  
 cn=48  
 fn=69  
 m=48, 49  
 48≤n≤56 (when m=48 is specified)  
 1≤n≤40 (when m=49 is specified)

- [Outline]**
- Sets error correction level of PDF417
  - When m=48, set by the level of n.

n	Function	Error Correction Code Words
48	Selects error correction level 0.	2
49	Selects error correction level 1.	4
50	Selects error correction level 2.	8
51	Selects error correction level 3.	16
52	Selects error correction level 4.	32
53	Selects error correction level 5.	64
54	Selects error correction level 6.	128
55	Selects error correction level 7.	256
56	Selects error correction level 8.	512

- When m=49, [set by the ratio (nx10%)] to the number of data code words.
- Calculation result (A) = Value of (number of data code words nx0.1) rounded to the nearest one.

Result (A)	Function	Error Correction Code Words
0 to 3	Selects error correction level 1.	4
4 to 10	Selects error correction level 2.	8
11 to 20	Selects error correction level 3.	16
21 to 45	Selects error correction level 4.	32
46 to 100	Selects error correction level 5.	64
101 to 200	Selects error correction level 6.	128
201 to 400	Selects error correction level 7.	256
401 to	Selects error correction level 8.	512

**[Default]** m=49, n=1

## fn=70: Function 70 Setting Options for PDF417

# GS ( k pL pH cn fn m

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><m>

[Range]  $(pL+pH \times 256) = 3$  ( $pL=3, pH=0$ )  
cn=48  
fn=70  
m=0, 1

[Outline] **[The specification which depend on the model]**  
• Specifies or clears the PDF417 option.

m	Function
0	Canceling Processing of simple PDF417
1	Specifying Processing of simple PDF417

[Caution] • When cleared with  $m=0$ , standard processing for PDF417 is conducted thereafter.

[Default] m=0

## fn=80: Function 80 Storing received data to 2D code data storage area

# GS ( k pL pH cn fn m d1...dk

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><m><d1...dk>

[Range]  $4 \leq (pL+pH \times 256) \leq 65535$  ( $0 \leq pL \leq 255, 0 \leq pH \leq 255$ )  
cn=48  
fn=80  
m=48  
 $0 \leq d \leq 255$   
 $k = (pL+pH \times 256) - 3$

[Outline]  
• Stores PDF417 2-dimensional code data (d1...dk) to 2-dimensional code data storage area.  
• Processes  $[(pL+pH \times 256) - 3]$  of d1 and thereafter as 2-dimensional code data.

[Sample Program]

[Print Results]

[Refer to Sample Program and Print Results for fn=81: Function181.](#)



fn=81: Function 81 Printing 2D code data in 2D code data storage area

# GS ( k pL pH cn fn m

**[Code]** <1D>H<28>H<6B>H<pL><pH><cn><fn><m>

**[Range]** (pL+pH×256)=3 (pL=3, pH=0)  
cn=48  
fn=81  
m=48

**[Outline]**

- Prints PDF417 stored in 2-dimensional code data storage area.

**[Caution]**

- Quiet zone (blank area around PDF417) shall be secured by the user.

**[Sample Program]**

```
LPRINT CHR$(&H1D),",", "k"; CHR$(10); CHR$(0); CHR$(48); CHR$(80); CHR$(48);  
LPRINT "CITIZEN"  
LPRINT CHR$(&H1D),",", "k"; CHR$(3); CHR$(0); CHR$(48); CHR$(81); CHR$(48);
```

**[Print Results]**



fn=65: Function 165 Specifying QRCode model

## GS ( k pL pH cn fn n1 n2

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><n1><n2>

[Range] (pL+pH×256)=4 (pL=4, pH=0)  
cn=49  
fn=65  
n1=49, 50  
n2=0

[Outline] • Specifies QRCode model.

n1	Function
49	Sets model 1.
50	Sets model 2.

[Default] n1=50  
n2=0

fn=67: Function 167 Sets the module width of QRCode

## GS ( k pL pH cn fn n

---

[Code] <1D>H<28>H<6B>H<pL><pH><cn><fn><n>

[Range] (pL+pH×256)=3 (pL=3, pH=0)  
cn=49  
fn=67  
1≤n≤16

[Outline] • Sets the width of 1 module of QRCode to n dots.

[Default] n=3

fn=69: Function 169 Setting QRCode error correction level

## GS ( k pL pH cn fn n

**[Code]** <1D>H<28>H<6B>H<pL><pH><cn><fn><n>

**[Range]**  $(pL+pH \times 256) = 3$  (pL=3, pH=0)  
 cn=49  
 fn=69  
 $48 \leq n \leq 51$

**[Outline]**

- Sets QRCode error correction level.

n	Function	Ref.: Recovery power (%) approximated
48	Selects error correction level L.	7
49	Selects error correction level M.	15
50	Selects error correction level Q.	25
51	Selects error correction level H.	30

fn=80: Function 180 Storing received data to 2D code data storage area

## GS ( k pL pH cn fn m d1...dk

**[Code]** <1D>H<28>H<6B>H<pL><pH><cn><fn><m><d1...dk>

**[Range]**  $4 \leq (pL+pH \times 256) \leq 7092$  ( $0 \leq pL \leq 255$ ,  $0 \leq pH \leq 28$ )  
 cn=49  
 fn=80  
 m=48  
 $0 \leq d \leq 255$   
 $k = (pL+pH \times 256) - 3$

**[Outline]**

- Stores QRCode 2-dimensional code data (d1...dk) to 2-dimensional code data storage area.
- Processes  $[(pL+pH \times 256) - 3]$  of d1 and thereafter as 2-dimensional code data.

**[Sample Program]**

**[Print Results]**

[Refer to Sample Program and Print Results for fn=81: Function181.](#)

fn=81: Function 181 Printing 2D code data in 2D code data storage area

# GS ( k pL pH cn fn m

---

**[Code]** <1D>H<28>H<6B>H<pL><pH><cn><fn><m>

**[Range]** (pL+pH×256)=3 (pL=3, pH=0)  
cn=49  
fn=81  
m=48

**[Outline]**

- Prints QRCode data stored in 2-dimensional code data storage area.

**[Caution]**

- Quiet zone (blank area around QRCode) shall be secured by the user.

**[Sample Program]**

```
LPRINT CHR$( &H1D ), "(", "k", CHR$(10), CHR$(0), CHR$(49), CHR$(80), CHR$(48);  
LPRINT "CITIZEN"  
LPRINT CHR$( &H1D ), "(", "k", CHR$(3), CHR$(0), CHR$(49), CHR$(81), CHR$(48);
```

**[Print Results]**



## 2.2.19 Other Commands

# DLE ENQ n

**[Function]** Real-time request to printer

**[Code]** <10>H<05>H<n>

**[Range]**  $0 \leq n \leq 2$

**[Outline]**

- The printer responds in real-time to the request that the host specifies with number “n”.

n	Function
0	At the setting of execution of GS ^ by the FEED switch, the same processing as that pressing the FEED switch once is carried out.
1	After recovering from an error, the printer resumes printing from the beginning of the line where the error occurred.
2	The printer clears the receive buffer and the print buffer, and then recovers from the error.

**[Caution]**

- (n = 1) or (n = 2) shall be used after removing the error.
- If another data string of <10>H<05>H<n> ( $1 \leq n \leq 2$ ) is received, the printer acts the same way as with this command. Therefore, the user should be reminded of this fact.

[Example 1]

Suppose a command “ESC \* m nL nH [d1 ... dk]”, where d1 = <10>H, d2 = <05>H, d3 = <01>H.

- The DLE EOT n command cannot be interleaved into the code string of another command consisting of 2 bytes or more.

[Example 2]

If the printer sends DLE ENQ n after the host has sent up to ESC 3 in its attempt to send ESC 3 n, the printer handles the ESC 3 as ESC 3 <10>H. Thus, the user should be cautious.

- This command is ignored during transmission of block data.

**[See Also]**

[DLE EOT](#)

# DLE DC4 fn m t (Specification of fn = 1)

---

**[Function]**      Outputting specified pulse in real-time

**[Code]**            <10>H<14>H<fn><m><t>

**[Range]**          fn=1,  
                      m=0, 1  
                      1 ≤ t ≤ 8

**[Outline]**

- A signal specified with “t” is output to the connector pin specified with “m”.

m	Connector Pin
0	Pin No. 2 of drawer kick-out connector
1	Pin No. 5 of drawer kick-out connector

- Set the ON time/OFF time to t x 100 ms, respectively.

**[Caution]**

- When receiving a code row coinciding with the code configuring this command, the same operation as this command takes place and attention by the user is required.  
Example: When corresponding code row is present in bit image data.
- This command must not be used between other command code rows.  
Example: This command is used in the bit image data.
- This command is ignored under the following conditions.
  - During sending block data
  - During output of signal to drawer kick connector
  - During occurrence of error

**[See Also]**      [ESC p](#)

# DLE DC4 fn d1...d7 (Specification of fn = 8)

---

**[Function]** Buffer clear

**[Code]** <10>H<14>H<fn><d1> ... <d7>

**[Range]** fn=8, d1=1, d2=3, d3=20, d4=1, d5=6, d6=2, d7=8

**[Outline]**

- Erases all data in receiving buffer or print buffer.
- Sends the following 3-byte data group.

	Hex.	Decimal	No. of Data
Header	37H	55	1 byte
Identifier	25H	37	1 byte
NULL	00H	0	1 byte

- Enters the state of selecting STANDARD MODE.

**[Caution]**

- When receiving a code row coinciding with the code configuring this command, the same operation as this command takes place and attention by the user is required.  
Example: When corresponding code row is present in bit image data.
- This command must not be used between other command code rows.  
Example: This command is used in the bit image data.
- This command is ignored under the following conditions.
- During sending block data

# ESC = n

**[Function]** Data input control

**[Code]** <1B>H<3D>H<n>

**[Range]**  $0 \leq n \leq 255$

**[Outline]**

- Selecting equipment for which data input from the host is valid.
- Each bit of “n” indicates as follows.
- When the printer has not been selected, this printer abandons all the received data until it is selected by this command.

Bit	Equipment	Value	
		0	1
0	Printer	Invalid	Valid
1	Not defined	—	—
2	Not defined	—	—
3	Not defined	—	—
4	Not defined	—	—
5	Not defined	—	—
6	Not defined	—	—
7	Not defined	—	—

**[Caution]**

- Even when the printer has not been selected, it can become BUSY state through printer operation.
- When the printer is deselected, this printer discards all the data until it is selected with this command. (Except DLE EOT, DLE ENQ, and DLE DC4)

**[Default]**

n=1



# ESC @

---

**[Function]** Initializing the printer

**[Code]** <1B>H<40>H

**[Outline]**

- Clears data stored in the print buffer and brings various settings to the initial state (Default state).

**[Caution]**

- The settings of DIP switches are not read again.
- Data inside the internal input buffer is not cleared.
- Macro definitions are not cleared.
- NV bit image definitions are not cleared.
- Data in the user NV memory is not cleared.

**[Sample Program]**

```
LPRINT CHR$(&H1B);"!"; CHR$(&H30);  
LPRINT CHR$(&H1B);"V"; CHR$(1);  
LPRINT "AAA"; CHR$(&HA);  
LPRINT CHR$(&H1B);"@";  
LPRINT "AAA"; CHR$(&HA);
```

**[Print Results]**

▷▷▷

AAA

Each setting has been initialized by this command.

# ESC L

---

**[Function]** Selecting PAGE MODE

**[Code]** <1B>H<4C>H

**[Outline]**

- Switches from STANDARD MODE to PAGE MODE.

**[Caution]**

- This command is only effective if it entered at the beginning of a line.
- This command is not effective if it is entered when in PAGE MODE.
- STANDARD MODE is restored when printing specified by FF is finished or when ESC S is issued.
- The character mapping start position will be the point specified by ESC T in the print area specified by ESC W.
- The commands listed below, which have separate settings for PAGE MODE and STANDARD MODE, are changed to the settings for PAGE MODE use.
  - (1) Spacing setting: ESC SP, FS S
  - (2) Line feed width setting: ESC 2, ESC 3
- The following commands are valid only in PAGE MODE.
  - (1) ESC V Specifying/canceling 90°-right-turned characters.
  - (2) ESC a Aligning the characters.
  - (3) ESC { Specifying/canceling the inverted characters.
  - (4) GS L Setting the left margin.
  - (5) GS W Setting the print area width.
- The following commands are disabled in PAGE MODE.
  - (1) GS ( A Executes test printing.
  - (2) FS p Prints NV memory bit image.
  - (3) FS q Defines NV memory bit image.
  - (4) GS v 0 Prints raster bit image.
- ESC @ restores STANDARD MODE.

**[See Also]** [Appendix 5.1.4 "Example of using PAGE MODE"](#)  
[FF](#), [CAN](#), [ESC FF](#), [ESC S](#), [ESC T](#), [ESC W](#), [GS W](#), [GS \](#)

# ESC S

---

**[Function]** Selecting STANDARD MODE

**[Code]** <1B>H<53>H

**[Outline]**

- Switches from PAGE MODE to STANDARD MODE.

**[Caution]**

- This command is only effective if it is entered when in PAGE MODE.
- Any data mapped in PAGE MODE is erased.
- After this command is executed, the beginning of the line is taken as the next print start position.
- The print area defined by ESC W is initialized.
- The commands listed below, which have separate settings for STANDARD MODE and PAGE MODE, are changed to the settings for STANDARD MODE use.
  - (1) Spacing setting: ESC SP, FS S
  - (2) Line feed width setting: ESC 2, ESC 3
- The following commands are valid only in setting in STANDARD MODE.
  - (1) ESC W Sets the space amount for setting print area in PAGE MODE.
  - (2) ESC T Selects the printing direction of character in PAGE MODE.
  - (3) GS \$ Sets the absolute position of character vertical direction in PAGE MODE.
- STANDARD MODE is selected when the printer is turned on or reset, or when ESC @ is executed.

**[See Also]** [FF](#), [ESC FF](#), [ESCL](#)

# GS ( A pL pH n m

**[Function]** Execution of test printing

**[Code]** <1D>H<28>H<41>H<pL><pH><n><m>

**[Range]**  $(pL+(pH \times 256))=2$  ( $pL=2, pH=0$ )  
 $0 \leq n \leq 2, 48 \leq n \leq 50$   
 $1 \leq m \leq 4, 49 \leq m \leq 52$

**[Outline]**

- Specified test printing will be executed.
- pL, pH will specify the number of subsequent parameters by  $(pL+(pH \times 256))$  bytes.
- "n" will specify the paper for test printing in the following table.

n	Category of Paper
0, 48	Basic paper (Paper rolls)
1, 49 2, 50	Paper rolls

- "m" will specify the category of test printing in the following table.

m	Category of Test Printing
1, 49	Hexadecimal dump
2, 50	Printer's status printing
3, 51	Rolling pattern printing

**[Caution]**

- This command is only valid when processed at the head of a line during the STANDARD MODE.
- The command will be ignored in PAGE MODE.
- During macro definition, if this command is processed, the macro definition is suspended, and the command starts being processed.
- Printer will reset its hard disk after finishing test printing. Therefore, the printer makes download characters, bit map images and macros undefined, clears the reception buffer/print buffer, and returns the various settings to defaults. At this time, the DIP switches are read again.
- Paper cutting is performed at the end of test printing.  
\*Functions with cutter-mounted model and when cutter is set to be enabled.
- Printer will be BUSY when the processing of the command starts.

# GS In

---

**[Function]** Sending the printer ID

**[Code]** <1D>H<49>H<n>

**[Range]**  $1 \leq n \leq 3$ ,  $49 \leq n \leq 51$ ,  $65 \leq n \leq 67$ ,  $n=69$ ,  $112$

**[Outline]**

- Sends the specified printer ID.

**[Caution]**

- Under DTR/DSR control, the printer sends the printer ID after verifying that the host is ready to receive.
- If the host is not ready to receive, the printer waits for the host to become ready to receive.
- Under XON/XOFF control, the printer sends the printer ID without checking whether or not the host is ready to receive.
- Because this command is executed when data is mapped in the receive buffer, there may be a delay between command receiving and printer ID sending depending on the condition of the receive buffer.
- If ASB (Automatic Status Back) is enabled by GS a, the host must discriminate between the printer ID due to this command and the status due to ASB.

PMU3300

n	Type of Printer ID	Specification	Value (Hex.)
1, 49	Model ID	PMU3300	7DH
2, 50	Type ID	Refer to table "Type ID" below	
3, 51	ROM version ID	Differs by ROM version.	

• Type ID If n=2, 50 is specified:

Bit	Meaning	Hex.	Decimal
0	Not equipped for 2 byte code support	00H	0
	Equipped for 2 byte code support	01H	1
1	Fixed	00H	0
2	Thermal paper	00H	0
3	Reserved	00H	0
4	Fixed	00H	0
5	Reserved	00H	0
6	Reserved	00H	0
7	Fixed	00H	0

• Printer information configuration on and after transmitted n=65 is shown below.

n	Kind of Printer Information	Information
65	Firmware version	Differs by firmware version.
66	Manufacturer name	CITIZEN
67	Model name	PMU3300
69	Kinds of multi-language fonts	Japanese Kanji specifications: KANJI JAPANESE
112	State of DSW	Refer to table "DSW" below (only serial model)

• Sends printer information specified by n=65 or more.

	Hex.	Number of Data
Header	5FH	1

Data	20H to 7FH	Subject to item to be responded
NULL	00H	1

• DSW If n = 112 is specified:

Bit	Function	Hex.	Decimal
0	Dip switch [DSW8] is OFF	00H	0
	Dip switch [DSW8] is ON	01H	1
1	Dip switch [DSW7] is OFF	00H	0
	Dip switch [DSW7] is ON	02H	2
2	Dip switch [DSW6] is OFF	00H	0
	Dip switch [DSW6] is ON	04H	4
3	Dip switch [DSW5] is OFF	00H	0
	Dip switch [DSW5] is ON	08H	8
4	Dip switch [DSW4] is OFF	00H	0
	Dip switch [DSW4] is ON	10H	16
5	Dip switch [DSW3] is OFF	00H	0
	Dip switch [DSW3] is ON	20H	32
6	Dip switch [DSW2] is OFF	00H	0
	Dip switch [DSW2] is ON	40H	64
7	Dip switch [DSW1] is OFF	00H	0
	Dip switch [DSW1] is ON	80H	128

\*only serial model

# GS P x y

---

**[Function]** Specifying the basic calculation pitch

**[Code]** <1D>H<50>H<x><y>

**[Range]**  $0 \leq x \leq 255$ ,  $0 \leq y \leq 255$

**[Outline]**

- This command sets the horizontal basic calculation pitch to approx. 25.4/x mm (1/x inches), and the vertical basic calculation pitch to approx. 25.4/y mm (1/y inches).
- If x = 0, the horizontal basic calculation pitch is reverted to the default value.
- If y = 0, the vertical basic calculation pitch is reverted to the default value.

**[Caution]**

- The horizontal direction is defined as the direction perpendicular to the paper feed, and the vertical direction is defined as the paper feed direction.
- In STANDARD MODE, the following parameters are used regardless of the character orientation (e.g. inverted or 90°-right-turned).
  - (1) Commands using x: ESC SP, ESC \$, ESC \, FS S, GS L, GS W
  - (2) Commands using y: ESC 3, ESC J
- In PAGE MODE, the parameters used depend on the character orientation, as follows:
  - (1) If the start point specified by ESC T is the top left or bottom right (The characters are mapped in the direction perpendicular to the paper feed):
    - Commands using x: ESC SP, ESC \$, ESC W, ESC \, FS S
    - Commands using y: ESC 3, ESC J, ESC W, GS \$, GS \
  - (2) If the start point specified by ESC T is the top right or bottom left (The characters are mapped in the paper feed direction):
    - Commands using x: ESC 3, ESC J, ESC W, GS \$, GS \
    - Commands using y: ESC SP, ESC \$, ESC W, ESC \, FS S
- This command does not affect any other values that are already set.
- If calculations made in combination with another command generate fractions, the fractions are corrected with the minimum pitch of the mechanism, and the remainder is omitted.

**[Default]**

x=203

y= 360

**[See Also]**

[Appendix 5.1 "Explanation on PAGE MODE"](#)

[ESC SP](#), [ESC \\$](#), [ESC 3](#), [ESC J](#), [ESC W](#), [ESC \](#), [GS \\$](#), [GSL](#), [GS W](#)



### 3. CHARACTER CODE TABLE

#### 3.1 Code Page

##### 3.1.1 Codepage 00H to 7FH & PC437 (USA, Europe Standard)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	á	▒	Ⓕ	Ⓖ	α	≡
1		XON	!	1	A	Q	a	q	ü	æ	í	▒	Ⓕ	Ⓕ	β	±
2			"	2	B	R	b	r	é	Æ	ó	▒	Ⓕ	Ⓖ	Γ	≥
3		XOFF	#	3	C	S	c	s	â	ô	ú	Ⓕ	Ⓕ	Ⓖ	Π	≤
4	EO T	DC4	\$	4	D	T	d	t	ä	ö	ñ	Ⓕ	Ⓕ	Ⓕ	Σ	∫
5	EN Q		%	5	E	U	e	u	à	ò	Ñ	Ⓕ	Ⓕ	Ⓕ	σ	∫
6			&	6	F	V	f	v	å	û	ä	Ⓕ	Ⓕ	Ⓕ	μ	÷
7			'	7	G	W	g	w	ç	ù	ó	Ⓕ	Ⓕ	Ⓕ	τ	≈
8		CAN	(	8	H	X	h	x	ê	ÿ	¿	Ⓕ	Ⓕ	Ⓕ	Φ	°
9	HT		)	9	I	Y	i	y	ë	Ö	Ⓕ	Ⓕ	Ⓕ	Ⓕ	θ	
A	LF		*	:	J	Z	j	z	è	Ü	Ⓕ	Ⓕ	Ⓕ	Ⓕ	Ω	.
B		ESC	+	;	K	[	k	{	ï	φ	½	Ⓕ	Ⓕ	▀	δ	√
C	FF	FS	,	<	L	\	l		î	£	¼	Ⓕ	Ⓕ	▀	∞	n
D	CR	GS	-	=	M	]	m	}	ì	¥	ı	Ⓕ	Ⓕ	▀	∅	²
E		RS	.	>	N	^	n	~	Ä	Pt	«	Ⓕ	Ⓕ	▀	€	■
F			/	?	O	_	o		Å	f	»	Ⓕ	Ⓕ	▀	∩	

### 3.1.2 Codepage 00H to 7FH & Katakana

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	_	⊥		-	タ	ミ	=	×
1		XON	!	1	A	Q	a	q	▬	⊥	°	ア	チ	ム	フ	円
2			"	2	B	R	b	r	▬	⊥	┌	イ	ツ	メ	≠	年
3		XOFF	#	3	C	S	c	s	■	⊥	└	ウ	テ	モ	≠	月
4	EOT	DC4	\$	4	D	T	d	t	■	—	,	エ	ト	ヤ	▲	日
5	ENQ		%	5	E	U	e	u	■	—	·	オ	ナ	ユ	▶	時
6			&	6	F	V	f	v	■		ヲ	カ	ニ	ヨ	▼	分
7			'	7	G	W	g	w	■		ア	キ	ヌ	ラ	▼	秒
8		CAN	(	8	H	X	h	x		┌	イ	ク	ネ	リ	♠	〒
9	HT		)	9	I	Y	i	y		└	ウ	ケ	ノ	ル	♥	市
A	LF		*	:	J	Z	j	z		└	エ	コ	ハ	レ	♦	区
B		ESC	+	;	K	[	k	{	■	└	オ	サ	ヒ	ロ	♣	町
C	FF	FS	,	<	L	\	l		■	└	ヤ	シ	フ	ワ	●	村
D	CR	GS	-	=	M	]	m	}	■	└	ユ	ス	ヘ	ン	○	人
E		RS	.	>	N	^	n	~	■	└	ヨ	セ	ホ	“	/	⋮
F			/	?	O	_	o		+	└	ツ	ソ	マ	°	\	

### 3.1.3 Codepage 00H to 7FH & PC850 (Multilingual)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	á	█	Ł	ø	Ó	-
1		XON	!	1	A	Q	a	q	ü	æ	í	█	ł	Ð	β	±
2			"	2	B	R	b	r	é	Æ	ó	█	ł	Ê	Ô	=
3		XOFF	#	3	C	S	c	s	â	ô	ú		ł	Ë	Ò	¾
4	EOT	DC4	\$	4	D	T	d	t	ä	ö	ñ		-	È	õ	¶
5	ENQ		%	5	E	U	e	u	à	ò	Ñ	Á	ł	€	Õ	§
6			&	6	F	V	f	v	å	û	ä	Â	ã	Í	μ	÷
7			'	7	G	W	g	w	ç	ù	ó	À	Ã	Î	þ	,
8		CAN	(	8	H	X	h	x	ê	ÿ	ı	©	Ł	İ	Ɔ	°
9	HT		)	9	I	Y	i	y	ë	Ö	®	ł	ł	ı	Ú	¨
A	LF		*	:	J	Z	j	z	è	Ü	¬	ł	ł	ı	Û	·
B		ESC	+	;	K	[	k	{	ï	ø	½	ł	ł	█	Ü	¹
C	FF	FS	,	<	L	\	l		î	£	¼	ł	ł	█	Ý	³
D	CR	GS	-	=	M	]	m	}	ì	Ø	ı	ç	=	ı	Ý	²
E		RS	.	>	N	^	n	~	Ä	x	«	\	ł	ı	-	■
F			/	?	O	_	o		Å	f	»	ł	α	█	'	

### 3.1.4 Codepage 00H to 7FH & PC860 (Portuguese)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	á		Ł	⊥	α	≡
1		XON	!	1	A	Q	a	q	ü	À	í		⊥	⊥	β	±
2			"	2	B	R	b	r	é	È	ó		⊥	⊥	Γ	≥
3		XOFF	#	3	C	S	c	s	â	ô	ú		⊥	⊥	π	≤
4	EOT	DC4	\$	4	D	T	d	t	ã	õ	ñ	⊥	⊥	⊥	Σ	∫
5	ENQ		%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	⊥	σ	∫
6			&	6	F	V	f	v	Á	Ú	a	⊥	⊥	⊥	μ	÷
7			'	7	G	W	g	w	ç	ù	o	⊥	⊥	⊥	τ	≈
8		CAN	(	8	H	X	h	x	ê	ì	¿	⊥	⊥	⊥	Φ	°
9	HT		)	9	I	Y	i	y	Ê	Ï	Ò	⊥	⊥	⊥	θ	·
A	LF		*	:	J	Z	j	z	è	Ü	⊥	⊥	⊥	⊥	Ω	·
B		ESC	+	;	K	[	k	{	Í	ç	½	⊥	⊥	⊥	δ	√
C	FF	FS	,	<	L	\	l		Ô	£	¼	⊥	⊥	⊥	∞	n
D	CR	GS	-	=	M	]	m	}	ì	Û	i	⊥	⊥	⊥	∅	₂
E		RS	.	>	N	^	n	~	Ã	Pt	«	⊥	⊥	⊥	€	■
F			/	?	O	_	o		Â	Ó	»	⊥	⊥	⊥	∩	

### 3.1.5 Codepage 00H to 7FH & PC863 (Canadian-French)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	;		L	⊥	α	≡
1		XON	!	1	A	Q	a	q	ü	È	'		⊥	⊥	β	±
2			"	2	B	R	b	r	é	Ê	ô		⊥	⊥	Γ	≥
3		XOFF	#	3	C	S	c	s	â	ô	ú	⊥	⊥	⊥	Π	≤
4	EOT	DC4	\$	4	D	T	d	t	Â	Ë	¨	⊥	⊥	⊥	Σ	∫
5	ENQ		%	5	E	U	e	u	à	Ï	˘	⊥	⊥	⊥	σ	∫
6			&	6	F	V	f	v	¶	û	³	⊥	⊥	⊥	μ	÷
7			'	7	G	W	g	w	ç	ù	-	⊥	⊥	⊥	τ	≈
8		CAN	(	8	H	X	h	x	ê	æ	î	⊥	⊥	⊥	Φ	°
9	HT		)	9	I	Y	i	y	ë	Ô	ˆ	⊥	⊥	⊥	θ	·
A	LF		*	:	J	Z	j	z	è	Ü	˘	⊥	⊥	⊥	Ω	·
B		ESC	+	;	K	[	k	{	ï	ø	½	⊥	⊥		δ	√
C	FF	FS	,	<	L	\	l		î	£	¼	⊥	⊥		∞	n
D	CR	GS	-	=	M	]	m	}	=	Ù	¾	⊥	⊥		∅	²
E		RS	.	>	N	^	n	~	À	Û	«	⊥	⊥		€	■
F			/	?	O	_	o		§	f	»	⊥	⊥		∩	

### 3.1.6 Codepage 00H to 7FH & PC865 (Nordic)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	á		L	⊥	α	≡
1		XON	!	1	A	Q	a	q	ü	æ	í		⊥	⊥	β	±
2			"	2	B	R	b	r	é	Æ	ó		⊥	⊥	Γ	≥
3		XOFF	#	3	C	S	c	s	â	ô	ú		⊥	⊥	π	≤
4	EOT	DC4	\$	4	D	T	d	t	ä	ö	ñ	⊥	⊥	⊥	Σ	∫
5	ENQ		%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	F	σ	J
6			&	6	F	V	f	v	å	û	ä	⊥	⊥	⊥	μ	÷
7			'	7	G	W	g	w	ç	ù	ö	⊥	⊥	⊥	τ	≈
8		CAN	(	8	H	X	h	x	ê	ÿ	ç	⊥	⊥	⊥	Φ	°
9	HT		)	9	I	Y	i	y	ë	Ö	ç	⊥	⊥	⊥	θ	·
A	LF		*	:	J	Z	j	z	è	Ü	ç	⊥	⊥	⊥	Ω	·
B		ESC	+	;	K	[	k	{	ï	ø	½	⊥	⊥	⊥	δ	√
C	FF	FS	,	<	L	\	l		î	£	¼	⊥	⊥	⊥	∞	n
D	CR	GS	-	=	M	]	m	}	ì	Ø	i	⊥	⊥	⊥	∅	²
E		RS	.	>	N	^	n	~	Ä	Pt	«	⊥	⊥	⊥	€	■
F			/	?	O	_	o		Å	f	α	⊥	⊥	⊥	∩	

### 3.1.7 Codepage 00H to 7FH & PC852 (Eastern Europe)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	á	█	Ł	đ	Ó	-
1		XON	!	1	A	Q	a	q	ü	Í	í	█	ł	Đ	β	"
2			"	2	B	R	b	r	é	Í	ó	█	ł	Ď	Ó	,
3		XOFF	#	3	C	S	c	s	â	ô	ú	ł	ł	Ě	Ń	˘
4	EOT	DC4	\$	4	D	T	d	t	ä	Ö	Ą	ł	-	d'	Ń	˘
5	ENQ		%	5	E	U	e	u	ù	Ł	ą	Á	ł	Ń	Ń	§
6			&	6	F	V	f	v	ć	İ	Ż	Â	Ă	í	Š	÷
7			'	7	G	W	g	w	ç	Ś	ż	Ě	Ă	î	Š	,
8		CAN	(	8	H	X	h	x	ł	Ś	Ę	Ş	Ł	ě	Ř	°
9	HT		)	9	I	Y	i	y	ë	Ö	ę	ł	ł	ł	Ú	¨
A	LF		*	:	J	Z	j	z	Ő	Ü		ł	ł	ł	Ŕ	·
B		ESC	+	;	K	[	k	{	ő	Ť	ż	ł	ł	█	Ů	ů
C	FF	FS	,	<	L	\	l		î	Ť	č	ł	ł	█	Ý	Ř
D	CR	GS	-	=	M	]	m	}	ž	ł	ş	ž	=	ł	Ý	ř
E		RS	.	>	N	^	n	~	Ä	x	«	ž	ł	Ů	ł	■
F			/	?	O	_	o		Ć	Č	»	ł	α	█	'	

### 3.1.8 Codepage 00H to 7FH & PC866 (Russian)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	А	Р	а	▒	Л	Щ	р	Ё
1		XON	!	1	А	Q	a	q	Б	С	б	▒	┌	Ѡ	с	ё
2			"	2	В	R	b	r	В	Т	в	▒	┐	ѡ	т	ё
3		XOFF	#	3	С	S	c	s	Г	У	г	┌	└	Ѣ	у	е
4	EOT	DC4	\$	4	Д	T	d	t	Д	Ф	д	└	—	ѣ	ф	ї
5	ENQ		%	5	Е	U	e	u	Е	Х	е	┐	┌	Ѥ	х	й
6			&	6	Ф	V	f	v	Ж	Ц	ж	┐	└	Ѧ	ц	ў
7			'	7	Г	W	g	w	З	Ч	з	┐	└	ѧ	ч	
8		CAN	(	8	И	X	h	x	И	Ш	и	┐	└	Ѩ	ш	°
9	HT		)	9	І	Y	i	y	Й	Щ	й	┐	└	ѩ	щ	)
A	LF		*	:	J	Z	j	z	К	Ъ	к	┐	└	Ѫ	ъ	·
B		ESC	+	;	К	[	k	{	Л	Ы	л	┐	└	▀	ы	Ў
C	FF	FS	,	<	L	\	l		М	Ь	м	┐	└	▀	ь	No
D	CR	GS	-	=	M	]	m	}	Н	Э	н	┐	└	▀	э	Ѡ
E		RS	.	>	N	^	n	~	О	Ю	о	┐	└	▀	ю	■
F			/	?	О	_	o		П	Я	п	┐	└	▀	я	



3.1.9 Codepage 00H to 7FH & PC857 (Turkish)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	Ç	É	á	█	Ł	o	ó	-
1		XON	!	1	A	Q	a	q	ü	æ	í	█	Ł	a	β	±
2			"	2	B	R	b	r	é	Æ	ó	█	Ł	Ê	ô	
3		XOFF	#	3	C	S	c	s	â	ô	ú		Ł	Ë	ò	¾
4	EOT	DC4	\$	4	D	T	d	t	ä	ö	ñ		-	È	õ	¶
5	ENQ		%	5	E	U	e	u	à	ò	Ñ	Á	+		Õ	§
6			&	6	F	V	f	v	å	û	Ğ	Â	ã	Í	μ	÷
7			'	7	G	W	g	w	ç	ù	ğ	À	Ã	Î		,
8		CAN	(	8	H	X	h	x	ê	í	ı	©	Ł	İ	x	°
9	HT		)	9	I	Y	i	y	ë	Ö	®	Ł	Ł	J	Ú	¨
A	LF		*	:	J	Z	j	z	è	Ü	¬	Ł	Ł	Ł	Û	.
B		ESC	+	;	K	[	k	{	ï	ø	½	Ł	Ł	█	Ü	¹
C	FF	FS	,	<	L	\	l		î	£	¼	Ł	Ł	█	ì	³
D	CR	GS	-	=	M	]	m	}	ı	Ø	ı	¢	=	ı	ÿ	²
E		RS	.	>	N	^	n	~	Ä	Ş	«	¥	Ł	ı	-	■
F			/	?	O	_	o		Å	ş	»	Ł	α	█	'	

3.1.10 Codepage 00H to 7FH & PC864 (Arabic)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	◦	β	(RSP)	•	ϕ	ذ	ـ	ﻉ
1		XON	!	1	A	Q	a	q	•	∞	(SHY)	ا	ء	ر	ف	س
2			”	2	B	R	b	r	•	ϕ	آ	ب	آ	ز	ق	ن
3		XOFF	#	3	C	S	c	s	√	±	£	٣	أ	ط	ك	هـ
4	EOT	DC4	\$	4	D	T	d	t	▒	½	⊗	٤	ؤ	ش	ل	فـ
5	ENQ		%	5	E	U	e	u	▒	¼	ل	٥	ع	ص	د	جـ
6			&	6	F	V	f	v	▒	≈		٦	كـ	ظ	نـ	يـ
7			'	7	G	W	g	w	▒	«		٧	ا	ط	هـ	غـ
8		CAN	(	8	H	X	h	x	▒	»	ا	٨	بـ	ظ	و	قـ
9	HT		)	9	I	Y	i	y	▒	لأ	بـ	٩	ة	ط	يـ	لأ
A	LF		*	:	J	Z	j	z	▒	لأ	ت	فـ	ت	ظ	يـ	لأ
B		ESC	+	;	K	[	k	{	▒		ث	:	ث	ا	ظ	ل
C	FF	FS	,	<	L	\	l		▒		،	سـ	جـ	ا	عـ	كـ
D	CR	GS	-	=	M	]	m	}	▒	لا	جـ	شـ	حـ	÷	غـ	يـ
E		RS	.	>	N	^	n	~	▒	لا	حـ	صـ	خـ	×	عـ	■
F			/	?	O	_	o		▒	،	خـ	؟	د	عـ	م	

3.1.11 Codepage 00H to 7FH & WPC1252

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p				°	À	Ð	à	ð
1		XON	!	1	A	Q	a	q		'	ı	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r	‚	'	¢	²	Â	Ò	â	ò
3		XOFF	#	3	C	S	c	s	ƒ	“	£	³	Ã	Ó	ã	ó
4	EOT	DC4	\$	4	D	T	d	t	„	”	¤	'	Ä	Ô	ä	ô
5	ENQ		%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	-		¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	-	§	•	Ç	×	ç	÷
8		CAN	(	8	H	X	h	x	^	~	¨	‚	È	Ø	è	ø
9	HT		)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A	LF		*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
B		ESC	+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	û
C	FF	FS	,	<	L	\	l		Œ	œ	¬	¼	Ì	Ü	ì	ü
D	CR	GS	-	=	M	]	m	}			-	½	Í	Ý	í	ý
E		RS	.	>	N	^	n	~	Ž	ž	®	¾	Î	Þ	î	þ
F			/	?	O	_	o			ÿ	¯	¿	Ï	ß	ï	ÿ

3.1.12 Codepage 00H to 7FH & Thai code 11

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	๕	๕	๖	๗	๘	๙	๖	๐
1		XON	!	1	A	Q	a	q	๕	๕	๗	๗	๘	๙	๖	๑
2			~	2	B	R	b	r	๕	๕	๖	๗	๘	๙	๖	๒
3		XOFF	#	3	C	S	c	s	๕	๕	๖	๗	๘	๙	๖	๓
4	EOT	DC4	\$	4	D	T	d	t	๕	๕	๖	๗	๘	๙	๖	๔
5	ENQ		%	5	E	U	e	u	๕	๕	๖	๗	๘	๙	๖	๕
6			&	6	F	V	f	v	๕	๕	๖	๗	๘	๙	๖	๖
7			'	7	G	W	g	w	๕	๕	๖	๗	๘	๙	๖	๗
8		CAN	(	8	H	X	h	x	๕	๕	๖	๗	๘	๙	๖	๘
9	HT		)	9	I	Y	<u>i</u>	y	๕	๕	๖	๗	๘	๙	๖	๙
A	LF		*	:	J	Z	j	z	๕	๕	๖	๗	๘	๙	๖	๐
B		ESC	+	;	K	[	k	{	๕	๕	๖	๗	๘	๙	๖	๑
C	FF	FS	,	<	L	¥	l		๕	๕	๖	๗	๘	๙	๖	๒
D	CR	GS	-	=	M	]	m	}	๕	๕	๖	๗	๘	๙	๖	๓
E		RS	.	>	N	^	n	~	๕	๕	๖	๗	๘	๙	๖	๔
F			/	?	O	_	o		๕	๕	๖	๗	๘	๙	๖	๕

3.1.13 Codepage 00H to 7FH & Thai code 18

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	┌	๑		ฐ	ภ	๕	๖	๐
1		XON	!	1	A	Q	a	q	└	๒	ก	ท	ม	๕	๖	๑
2			~	2	B	R	b	r	┌	๓	ข	ฒ	ย	๑	๒	๓
3		XOFF	#	3	C	S	c	s	└	๔	ช	ณ	จ	๑	๒	๓
4	EOT	DC4	\$	4	D	T	d	t		๕	ค	ด	ถ	๑	๒	๓
5	ENQ		%	5	E	U	e	u	—	๖	ต	ด	ล	๑	๒	๓
6			&	6	F	V	f	v	└	๗	ฒ	ถ	ภ	๑	๒	๓
7			'	7	G	W	g	w	└	๘	ง	ท	จ	๑	๒	๓
8		CAN	(	8	H	X	h	x	└	๙	จ	ช	ศ	.	'	๓
9	HT		)	9	I	Y	i	y	└	๑๐	ฉ	น	ษ	.	'	๓
A	LF		*	:	J	Z	j	z	└	๑๑	ช	บ	ส	.	'	๓
B		ESC	+	;	K	[	k	{	■	๑๒	ช	ป	ห	.	'	๓
C	FF	FS	,	<	L	¥	l		←	๑๓	ฉ	ผ	ฬ	.	'	๓
D	CR	GS	-	=	M	]	m	}	↑	๑๔	ญ	ฝ	อ	.	'	๓
E		RS	.	>	N	^	n	~	→	๑๕	ญ	พ	ฮ	.	'	๓
F			/	?	O	_	o		↓	๑๖	ญ	ฟ	ฯ	<b>B</b>	⊙	

3.1.14 Codepage 00H to 7FH & TCVN-3 (Vietnamese)

TCVN-3

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p						é		
1		XON	!	1	A	Q	a	q			Ă			ẹ	ỏ	ủ
2			"	2	B	R	b	r			Â			ề	õ	ũ
3		XOFF	#	3	C	S	c	s			Ê			ề	ó	ú
4	EOT	DC4	\$	4	D	T	d	t			Ô			ễ	ọ	ụ
5	ENQ		%	5	E	U	e	u			Ơ	à		é	ồ	ừ
6			&	6	F	V	f	v			Ư	ả	ặ	ệ	ỗ	ử
7			'	7	G	W	g	w			Đ	ã	ằ	ì	ỗ	ữ
8		CAN	(	8	H	X	h	x			ă	á	ằ	ỉ	ó	ừ
9	HT		)	9	I	Y	i	y			â	ạ	ằ		ộ	ự
A	LF		*	:	J	Z	j	z			ê		ằ		ờ	ỳ
B		ESC	+	;	K	[	k	{			ô	ả	ậ		ở	ỷ
C	FF	FS	,	<	L	\	l				ơ	ả	è	ỉ	ỡ	ỷ
D	CR	GS	-	=	M	]	m	}			ư	ả		í	ớ	ỷ
E		RS	.	>	N	^	n	~			đ	ả	ề	ị	ợ	ỵ
F			/	?	O	_	o						ễ	ò	ù	

TCVN-3 Caps

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p						É		
1		XON	!	1	A	Q	a	q			Ă			Ẹ	Ỡ	Ủ
2			"	2	B	R	b	r			Â			Ề	Õ	Ũ
3		XOFF	#	3	C	S	c	s			Ê			Ề	Ó	Ú
4	EOT	DC4	\$	4	D	T	d	t			Ô			Ễ	Ọ	Ụ
5	ENQ		%	5	E	U	e	u			Ơ	À		É	Ồ	Ừ
6			&	6	F	V	f	v			Ư	Ả	Ặ	Ệ	Ỡ	Ử
7			'	7	G	W	g	w			Đ	Ã	Ằ	Ì	Ỡ	Ữ
8		CAN	(	8	H	X	h	x			Ă	Á	Ằ	Ỉ	Ó	Ừ
9	HT		)	9	I	Y	i	y			Â	Ạ	Ằ		Ộ	Ự
A	LF		*	:	J	Z	j	z			Ê		Ằ		Ờ	Ỡ
B		ESC	+	;	K	[	k	{			Ô	Ả	Ặ		Ở	Ỡ
C	FF	FS	,	<	L	\	l				Ơ	Ả	È	Ỉ	Ỡ	Ỡ
D	CR	GS	-	=	M	]	m	}			Ư	Ả		Í	Ớ	Ỡ
E		RS	.	>	N	^	n	~			Đ	Ả	Ề	Ị	Ợ	Ỡ
F			/	?	O	_	o						Ễ	Ò	Ù	

3.1.15 Codepage 00H to 7FH & WPC1258 (Vietnamese)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE		0	@	P	`	p	€			°	À	Đ	à	đ
1		XON	!	1	A	Q	a	q		'	i	±	Á	Ñ	á	ñ
2			”	2	B	R	b	r	¸	'	¢	²	Â	'	â	.
3		XOFF	#	3	C	S	c	s	f	”	£	³	Ă	Ó	ă	ó
4	EOT	DC4	\$	4	D	T	d	t	„	”	¤	'	Ä	Ô	ä	ô
5	ENQ		%	5	E	U	e	u	…	.	¥	µ	Å	σ	å	σ
6			&	6	F	V	f	v	†	-	‡	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	-	§	.	Ç	×	ç	÷
8		CAN	(	8	H	X	h	x	^	~	¨	¸	È	Ø	è	ø
9	HT		)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A	LF		*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B		ESC	+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	û
C	FF	FS	,	<	L	¥	l	l	œ	œ	¬	¼	`	Ü	'	ü
D	CR	GS	-	=	M	]	m	}			-	½	Í	Ʈ	í	Ʈ
E		RS	.	>	N	^	n	~			®	¾	Î	~	î	đ
F			/	?	O	_	o			ÿ	-	¿	Ï	ß	ï	ÿ

### 3.2 International Character Code Table

	Country	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U.S.A	#	\$	@	[	\	]	^	'	{		}	~
1	France	#	\$	à	°	ç	§	^	'	é	ù	è	¨
2	Germany	#	\$	§	Ä	Ö	Ü	^	'	ä	ö	ü	ß
3	U.K.	£	\$	@	[	\	]	^	'	{		}	~
4	Denmark I	#	\$	@	Æ	Ø	Å	^	'	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain I	Pt	\$	@	í	Ñ	¿	^	'	¨	ñ	}	~
8	Japan	#	\$	@	[	\	]	^	'	{		}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	Spain II	#	\$	á	í	Ñ	¿	é	'	ì	ñ	ó	ú
12	Latin America	#	\$	á	í	Ñ	¿	é	ü	ì	ñ	ó	ú
13	Korea	#	\$	@	[	₩	]	^	'	{		}	~
14	Croatia	#	\$	Ž	Š	Đ	Ć	Č	ž	š	đ	ć	č
15	China	#	\	@	[	\	]	^	'	{		}	~
16	Vietnam	đ	\$	@	[	\	]	^	'	{		}	~



## 4. Memory Switch

Memory switch is a function to save the user selected settings into NV memory, where memory switch setting will be held unless memory switch is changed.

Memory switch is changed by manual setting or by command in the memory switch change mode.

\* Hereafter, memory switch is referred to as MSW.

### 4.1 Memory Switches

#### ■ Memory switches (MSW1, MSW2, MSW3, MSW4, MSW5, MSW6)

No.	Function	OFF	ON
MSW1-1	Power ON Info	Valid	<b>Not Send</b>
MSW1-2	Buffer Size (* Note 1)	<b>4K bytes</b>	45 bytes
MSW1-3	Busy Condition	<b>Full / Err</b>	Full
MSW1-4	Receive Error	<b>Print “?”</b>	No Print
MSW1-5	CR Mode	<b>Ignored</b>	LF
MSW1-7	DSR Signal	<b>Invalid</b>	Valid
MSW2-2	Auto Cutter	Invalid	<b>Valid</b>
MSW2-3	Spool Print	<b>Invalid</b>	Valid
MSW2-4	Full Col Print	Line Feed	<b>Wait Data</b>
MSW2-5	Resume aft PE	<b>Next</b>	Top
MSW2-8	PNE Sensor	<b>Valid</b>	Invalid
MSW3-1	Resume Cutter Error	<b>Valid</b>	Invalid
MSW3-2	PE signal by PNE	Valid	<b>Invalid</b>
MSW3-6	Timeout Cut	<b>Invalid</b>	Valid
MSW3-7	CBM1000 Mode	<b>Invalid</b>	Valid
MSW3-8	Resume Open Err	<b>Close</b>	Command
MSW4-3	Feed & Cut at TOF	Invalid	<b>Valid</b>
MSW4-8	Partial Only	Invalid	<b>Valid</b>
MSW5-2	Line Pitch	<b>1/360</b>	1/406
MSW5-3	USB Mode	Virtual com	<b>Printer Class</b>
MSW5-6	Speed/quality	<b>Speed</b>	Quality
MSW6-1	Act. For Driver	<b>Invalid</b>	Valid
MSW6-6	Hebrew	<b>Invalid</b>	Valid
MSW6-7	Paper Exit Sensor	<b>Invalid</b>	Valid
MSW6-8	Continuous Print	<b>Invalid</b>	Valid

■ . . . Default (factory shipment setting)

Note 1: MSW1-2 In case of USB interface, the input buffer is set to 16Kbytes regardless of this setting.

■ Customize value (MSW7, MSW8, MSW9, MSW10)

Customize value can be set by the GS (E command.)

No.	Function	Value	
MSW7-1	Baud Rate	1200bps	2400bps
		4800bps	9600bps
		19200bps	38400bps
		57600bps	<b>115200bps</b>
MSW7-2	Data Length	7 bits	<b>8 bits</b>
MSW7-3	Stop Bit	<b>1 bit</b>	2 bits
MSW7-4	Parity	<b>NONE</b>	EVEN
		ODD	—
MSW7-5	Flow Control	DTR/DSR	<b>XON/XOFF</b>
MSW7-7	VCom Protocol	<b>PC setting</b>	DTR/DSR
		XON/XOFF	—
MSW8-1	Print Width	360dots	512dots
		<b>384dots</b>	576dots
		420dots	390dots
		432dots	546dots
		436dots	
MSW9-1	Code Page	<b>PC437</b>	PC866
		Katakana	PC857
		PC850,PC858	WPC1252
		PC860	Space
		PC863	PC864
		PC865	ThaiCode18
		PC852	WPC1258
MSW9-2	Int'l Char Set	<b>U.S.A.</b>	Japan
		France	Norway
		Germany	Denmark2
		England	Spain2
		Denmark	Latin America
		Sweden	Korea
		Italy	Croatia
		Spain	China
		Vietnam	
MSW9-3	Kanji	ON	<b>OFF</b>
MSW9-4	JIS / Shift JIS	<b>JIS</b>	Shift JIS

■ . . . Default (factory shipment setting)

No.	Function	Value	
MSW10-1	Print Density	70%	75%
		80%	85%
		90%	95%
		<b>100%</b>	105%
		110%	115%
		120%	125%
		130%	135%
		140%	
MSW10-2	Print Speed	Level1	Level2
		Level3	Level4
		Level5	Level6
		Level7	Level8
		<b>Level9</b>	
MSW10-4	Emulation mode	<b>ESC/POS</b>	Axiom

■ . . . Default (factory shipment setting)

## 4.2 Details of Memory Switches

This section describes the function of memory switch.

### 4.2.1 MSW1

●**MSW1-1:** Setting the power ON notify

[Outline] At power ON, to notify the host of the printer power ON, printer can send to host 3 byte power ON notify status data ( 3BH 31H 00H).

Set to enable/disable for sending the power ON notify status data.

	OFF(0)	ON(1)
Power ON Info	Valid	Not send

ON (1) OPERATION:

Function to notify power ON is disabled, sending no status to host.

OFF (0) OPERATION:

Function to notify power ON is enabled, sending status to host.

●**MSW1-2:** Input buffer

[Outline] Select the input buffer (receive buffer) size.

	OFF(0)	ON(1)
Buffer Size	4Kbytes	45bytes

ON (1) OPERATION: Input buffer size is set to 45 bytes.

From when free area decreases to 16 bytes until it increases to 26 bytes, receive buffer is full with printer BUSY status.

OFF (0) OPERATION: Input buffer size is set to 4K bytes.

From when free area decreases to 128 bytes until it increases to 256 bytes, receive buffer is full with printer BUSY status.

●**MSW1-3:** Busy condition

[Outline] Select the condition that printer is BUSY. Automatic status send function also runs.

	OFF(0)	ON(1)
Busy Condition	Buffer full/Off-line	Buffer full

ON (1) OPERATION: If receive buffer is full, printer is BUSY.

Automatic status send (ASB) function is enabled.

OFF (0) OPERATION: If receive buffer is full or off-line, printer is BUSY.

Automatic status send (ASB) function is disabled.

[Additional Description]

Even if ON is selected, printer enters BUSY status when power is turned on or reset by I/F or at self test print

Printer Status		MSW1-3 OFF	MSW1-3 ON
Off-line	Power-up or reset used by I/F	●	●
	Self-print	●	●
	Cover open	●	-
	Paper-feed by FEED SW	●	-
	Paper-end (including print stop in PNE)	●	-
	Error generation	●	-
	Waiting during macro run by FEED SW	●	-
Buffer full	Receive buffer full	●	●

●**MSW1-4:** Receive error character

[Outline] Select handling of data detected where the serial communication detects the receive data framing error, overrun error and parity error.

	OFF(0)	ON(1)
Receive Error	Print ?	No Print

ON (1) OPERATION: Not printed as “?”

OFF (0) OPERATION: Printed as “?”

●**MSW1-5:** CR code

[Outline] Select the printer when receiving CR(<0D>H) code.

	<b>OFF(0)</b>	<b>ON(1)</b>
CR mode	Ignored	LF

ON (1) OPERATION:

Select the same operation with LF when receiving CR code.

Print data in print buffer and put linefeeds as specified.

OFF (0) OPERATION:

CR code may be ignored with no actions if receiving CR code.

●**MSW1-7:** DSR signal

[Outline] Printer can be reset with DSR (serial I/F-6pin) signal. Select enable/disable of reset function with this signal.

	<b>OFF(0)</b>	<b>ON(1)</b>
DSR Signal	Invalid	Valid

ON (1) OPERATION: Used as reset signal

OFF (0) OPERATION: Not used as reset signal

●**MSW1-8:** INIT signal

[Outline] Printer can be reset with INIT (serial I/F-25Pin) signal. Select enable/disable of reset function with this signal.

	<b>OFF(0)</b>	<b>ON(1)</b>
INIT Signal	Invalid	Valid

ON (1) OPERATION: Used as reset signal

OFF (0) OPERATION: Not used as reset signal

## 4.2.2 MSW2

●**MSW2-2:** Auto-cutter operation

[Outline] Select auto-cutter enable/disable.

	<b>OFF(0)</b>	<b>ON(1)</b>
Auto Cutter	Invalid	Valid

ON (1) OPERATION: Auto-cutter enabled

OFF (0) OPERATION: Auto-cutter disabled

●**MSW2-3:** Buffering

[Outline] Select buffering print enable/disable.

	<b>OFF(0)</b>	<b>ON(1)</b>
Spool Print	Invalid	Valid

ON (1) OPERATION: Buffering print is enabled. Buffering print means that save a certain amount of print buffer to internal RAM for collective printing

- Save a certain amount of print buffer to internal RAM for collective printing.
- If cut command such as GS+V ESC+i ESC +m are entered, print starts even before the specified amount is reached. FF or GS+FF command In Black mark mode or label model works same way.
- Even if no cut command is entered and the entered data does not reach the specified amount, entered data to print buffer is printed after no new data comes to print buffer for certain period.

OFF (0) OPERATION: Buffering print is disabled.

●MSW2-4: Full Columns print

[Outline] Select the processing if print data closes to the end of line or the right of print width.

	OFF(0)	ON(1)
Full Col print	Line Feed	Wait Data

ON (1) OPERATION:

If printer receives data/command exceeding the full column, printer further waits for print data. If data exceeding the full column is a command, printer operates following the command.

OFF (0) OPERATION:

If printer receives data/command exceeding the full column, it automatically prints data in buffer followed by a line-feed.

<Example>

If the first data after exceeding the full column is a control code such as<ESC !>;

If OFF (0) is set, print data within buffer and put a line feed, or

If ON (1) is set, print no data within buffer and further wait for print data.

●MSW2-5: Cover close return

[Outline] Select the operating taken after printer cover is opened during printing, paper is refilled with no-paper (PE) is detected, then cover is closed to restart printing.

	OFF(0)	ON(1)
Resume aft PE	Next	Top

ON (1) OPERATION:

Restart printing from the heading of remaining data.

During printing image, bar code, vertically-doubled character or page mode, if cover open or PE is detected, then after return, restart printing from heading of the remaining data.

OFF (0) OPERATION:

Print data continued from the previous printing. During printing, if cover open or PE is detected, then after return, restart printing data immediately after an error data.

●MSW2-8: PNE sensor

[Outline] Select paper near-end enable/disable.

	OFF(0)	ON(1)
PNE Sensor	Valid	Invalid

ON (1) OPERATION: Disable paper near-end

OFF (0) OPERATION: Enable paper near-end



### 4.2.3 MSW3

●**MSW3-1:** Auto-cutter return

[Outline] Selects the return method from cutter lock error.

	<b>OFF(0)</b>	<b>ON(1)</b>
Resum Ctrr Err	Valid	Invalid

ON (1) OPERATION: Return by command.

After removing error cause, return with command <DLE ENQ n>.

OFF (0) OPERATION: Return with FEED switch.

After removing error cause, return by long pressing FEED SW (1 sec or longer).

●**MSW3-2:** Clearing Cover Open Error

[Outline] Selects the method of clearing Cover Open error. (CT-S300 unique)

	<b>OFF(0)</b>	<b>ON(1)</b>
Resum Open Err	Close	Command

Operation at ON (1):

When the printer detects that cover is closed and the printer receives a command <DLE+ENQ+n>, the error is cleared.

Operation at OFF (0):

When the printer detects that the cover is closed, it automatically clears the error.

●**MSW3-6:** Time out cut (PMU3300 only)

[Outline] Selects column number.

	<b>OFF(0)</b>	<b>ON(1)</b>
Time out cut	Invalid	Valid

Operation at ON (1): Printer cut paper without receiving cut command.

(Automatic cutting is performed in 100ms from end of data.)

Operation at OFF (0): Printer cuts paper only by the command.

●**MSW3-7:** CBM compatible mode

[Outline] Select enable/disable of CBM compatible mode.

	<b>OFF(0)</b>	<b>ON(1)</b>
CBM Mode	Invalid	Valid

ON (1) OPERATION: Enable CBM compatible mode.

Control code <ESC ~ J> becomes available.

OFF (0) OPERATION: CBM compatible mode is disabled.

●**MSW3-8:** Cover open during printing

[Outline] Select the method to cancel the cover open error during printing

	<b>OFF(0)</b>	<b>ON(1)</b>
Resum Open Err	Close	Command

ON (1) OPERATION: Cover open error during printing becomes a return allowed error.

When the cover is closed and the command <DLE+ENQ+r> is received, the error is canceled.

OFF (0) OPERATION: Automatic recovery error for the cover open error during printing.

Closing the cover will automatically recover the device from the cover open error.

#### 4.2.4 MSW4

●**MSW4-3:** Paper feed & cut at closing cover

[Outline] When cover is closed, printer feeds paper and cuts.

	<b>OFF(0)</b>	<b>ON(1)</b>
Feed & Cut at TOF	Invalid	Valid

ON (1) OPERATION: Paper feed & cut at closing cover is enabled.

OFF (0) OPERATION: Paper feed & cut at closing cover is disabled.

●**MSW4-8:** Forcible partial cut

[Outline] Select the operation taken when full cut command is received.

	<b>OFF(0)</b>	<b>ON(1)</b>
Partial only	Invalid	Valid

ON (1) OPERATION: When full cut command is received, partial cut, not full cut, is taken.

OFF (0) OPERATION: When full cut command is received, full cut is taken.

## 4.2.5 MSW5

●**MSW5-2:** Basic vertical calculation pitch

[Outline] Select the basic calculation pitch in the paper feed direction.

	<b>OFF(0)</b>	<b>ON(1)</b>
Line Pitch	360	406

ON (1) OPERATION: Basic vertical calculation pitch is set to 1/406 inch.

Line-feed length is 3.75mm by default.

OFF (0) OPERATION: Basic vertical calculation pitch is set to 1/360 inch.

Line-feed length is 4.23mm by default.

●**MSW5-3:** USB mode

[Outline] Select USB mode.

	<b>OFF(0)</b>	<b>ON(1)</b>
USB Mode	Virtual COM	Printer Class

ON (1) OPERATION: Operated as Printer class

OFF (0) OPERATION: Operated as virtual COM class

●**MSW5-6:** Speed / Quality (PMU3300 only)

[Outline] Selects the valid/invalid of high quality printing mode

In high quality printing mode, printing speed can be slower than normal mode.

	<b>OFF(0)</b>	<b>ON(1)</b>
Speed / Quality	Speed	Quality

ON (1) OPERATION: Prints in high quality mode and less speed

OFF (0) OPERATION: Prints in normal mode and normal speed

#### 4.2.6 MSW6

●**MSW6-1:** Mode to use with the driver

[Outline] Selects the valid/invalid of mode to use with the driver

	OFF(0)	ON(1)
Mode to use with the driver	Invalid	Valid

ON (1) OPERATION: FAULT signal is not output in the error condition to parallel port..

ASB is valid at power on. (Same behavior as GS a n command and n = 15)

OFF (0) OPERATION: FAULT signal is output in the error condition to parallel port..

ASB is invalid at power on. (Same behavior as GS a n command and n = 0)

Remarks: Function below is added for the models after CT-S251/CT-S8xxII/CT-S6xxII.

Settings of automatic buffer clearing function at printer error are as follows.

- ON(1) OPERATION Automatic buffer clear at error detection is enabled.
- OFF(0) OPERATION Automatic buffer clear at error detection is disabled.

●**MSW6-7:** Paper exit sensor (PMU3300 only)

[Outline] Selects whether the paper exit sensor is enabled or disabled.

	OFF(0)	ON(1)
Paper exit sensor	Invalid	Valid

Operation when ON (1): Paper exit sensor is enabled..

Operation when OFF (0): Paper exit sensor is disabled.

●**MSW6-8:** Continuous Print (PMU3300 only)

[Outline] Selects whether the next printing is done continuously when there is already printed paper at the paper exit sensor.

	OFF(0)	ON(1)
PContinuous print	Invalid	Valid

ON (1) OPERATION: Even if there is paper on the paper exit sensor, the next print is performed.

OFF (0) OPERATION: If there is paper at the paper exit sensor, the next printing will not take place.

## 4.2.7 MSW7

●**MSW7-1:** Baud rate

[Outline] Selects the baud rate which is serial interface communication condition.  
Enabled if DSW1-1 OFF is set [following memory switch setting].

	Setting Value
Baud Rate	1200bps, 2400bps,4800bps,9600bps, 19200bps, 38400bps,57600bps, 115200bps

●**MSW7-2:** Data length

[Outline] Selects the data length, which is a serial interface communication condition.  
Enabled if DSW1-1 OFF is set [following memory switch setting].

	Setting Value
Data Length	7bits,8bits

●**MSW7-3:** Stop bit

[Outline] Selects the stop bit, which is a serial interface communication condition.  
Enabled if DSW1-1 OFF is set [following memory switch setting].

	Setting Value
Stop Bit	1bit,2bits

●**MSW7-4:** Parity

[Outline] Selects the parity, which is a serial interface communication condition.  
Enabled if DSW1-1 OFF is set [following memory switch setting].

	Setting Value
Parity	NONE, ODD, EVEN

●**MSW7-5:** Flow control

[Outline] Selects the flow control, which is a serial interface communication condition.  
Enabled if DSW1-1 OFF is set [following memory switch setting].

	Setting Value
Flow Control	DTR/DSR, XON/XOFF

●**MSW7-6:** DMA control

[Outline] Selects the valid/invalid of DMA(Direct Memory Access) control.

	<b>Setting Value</b>
DMA control	Valid, Invalid

●**MSW7-7:** VCom flow control

[Outline] In MSW5-3, selects the flow control when virtual COM is set.

	<b>Setting Value</b>
VCom Protocol	PC setting, DTR/DSR, XON/XOFF

#### 4.2.8 MSW8

●**MSW8-1:** Print width

[Outline] Selects the print width in dots.

	<b>Setting Value</b>
Print Width	832dots, 720dots, 660dots, 640dots, 576dots, 512dots, 436dots, 432dots, 420dots, 384dots, 360dots, 390dots, 546dots, User Defined (CT-S4500 unique)

## 4.2.9 MSW9

●MSW9-1: Code page

[Outline] Selects the codepage.

	Setting Value
Codepage	PC437, Katakana, PC850, PC858, PC860, PC863, PC865, PC852, PC866, PC857, WPC1252, Space page, PC864, ThaiCode11 1Pass, ThaiCode11 3Pass, ThaiCode18 1 Pass, ThaiCode18 3Pass, TCVN3, TCVN3 Caps, WPC1258

●MSW9-2: International character

[Outline] Selects the international character.

	Setting Value
Int'Char Set	USA, France, Germany, UK, Denmark, Sweden, Italy, Spain, Japan, Norway, Denmark 2, Spain2, Latin America, Korea

●MSW9-3: Kanji

[Outline] Selects the enable/disable of Kanji.

	Setting Value
Kanji	ON, OFF

●MSW9-4: JIS(CT-S280/CT-S281/CT-S310/CT-S310II/CT-S2000/CT-S4000/  
CT-S801/CT-S851/CT-S601/CT-S651/CT-S251 unique)

[Outline] Selects the kanji code system.

	Setting Value
JIS/Shift JIS	JIS, Shift JIS



#### 4.2.10 MSW10

- MSW10-1: Print density  
[Outline] Selects the print density.

	<b>Setting Value</b>
Print Density	70%, 75%, 80%, 85%, 90%, 95%, 100%, 105%, 110%, 115%, 120%, 125%, 130%, 135%, 140%

- MSW10-2: Print speed  
[Outline] Selects the print speed.

	<b>Setting Value</b>
Print Speed	Level1, Level2, Level3, Level4, Level5, Level6, Level7, Level8, Level9 (CT-S4500 supports only Level5 to Level 9)

- MSW10-4: Emulation Type  
[Outline] Selects the emulation between ESC/POS and Axiohm.

	<b>Setting Value</b>
Emulation	ESC/POS, AXIOHM

## 5. APPENDIX

### 5.1 Explanation on PAGE MODE

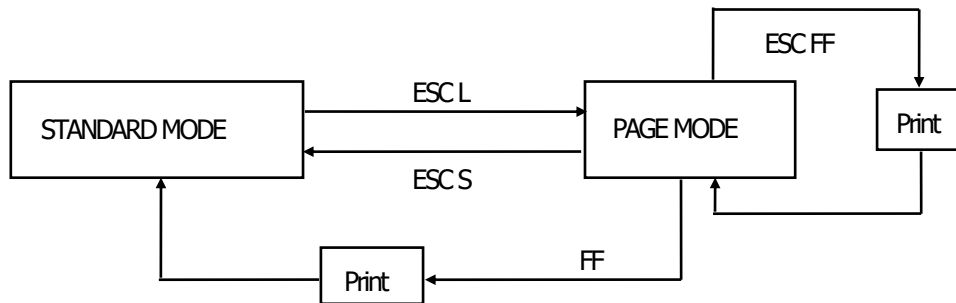
#### 5.1.1 Overview

The printer has two print modes: STANDARD and PAGE.

In STANDARD MODE, the printer prints or feeds paper each time it receives a print or paper feed command. In PAGE MODE, when the printer receives print commands and/or form feed commands, it simply forwards them to the specified print area of memory. Only when an ESC FF or FF is executed all the data mapped in the print area will then be printed in a batch.

For example, suppose you executed a print and line feed for data "ABCDEF"<LF>. In STANDARD MODE, the data "ABCDEF" is printed and paper is advanced one line. In PAGE MODE, the data "ABCDEF" is written in the specified print area of memory, and the memory location for the storage of the next print data is shifted one line.

The printer enters PAGE MODE with an ESC L, so that all commands received after that point are handled in PAGE MODE. When an ESC FF is executed, the data received until then is printed in a batch. When an FF is executed, the data received until then is printed in a batch, after which the printer returns to STANDARD MODE. An ESC S causes the printer to immediately return to STANDARD MODE; any print data, however, that has been stored in PAGE MODE is not printed. Instead it will be cleared.



[Switching Between STANDARD MODE and PAGE MODE]

#### 5.1.2 Values Set by Each Command in STANDARD MODE and PAGE MODE

- (1) The values set with commands are common to the STANDARD MODE and PAGE MODE. The values set with any of the commands listed below are, however, treated differently and stored separately for the STANDARD and PAGE MODES.

- ESC SP, ESC 2, ESC 3, FS S

- (2) The maximum number of print dots in the horizontal direction is the print area width (usually 576 dots / 3 inches) in the standard mode. However, when using the y direction (paper feeding direction) in the page mode, printing exceeding the printing area width becomes possible.

However, when the printing area width in the y direction is secured by <ESC W> and the value in the printing direction n in <ESC T> is 1 or 3.

### 5.1.3 Mapping of Print Data in the Print Area

Print data is mapped in the print area as follows:

(1) The print area is set by ESC W. When the printer has finished all of the print and paper feed actions specified before receiving an ESC W, the ESC W sets the right end (as viewed facing the printer) as the start point (x0, y0) of the print area. The print area is a rectangle defined by two edges extending from the start point (x0, y0): one edge running in the "x" (Horizontal) direction by "dx" pitch (inclusive of the start point), and the other running in the "y" (Vertical) direction by "dy" pitch. (If no ESC W is defined, the default values are used to define the print area.)

(2) With a print area defined by ESC W and a print direction specified by ESC T, when the printer receives print data, the print data is mapped in the print area where point A (see the Figure 4-1 "Mapping Position for Character Data") is used as the initial value of the start point. If the print data consists of characters, this start point serves as the baseline.

If the print data is a downloaded bitmap image or a bar code, the print data is mapped with its lower-left point B aligned to the baseline. (See the Figure 4-2 "Mapping Positions for Print Data".) When attempting to map the HRI characters of a bar code, however, the section above the standard character height will not be printed.

(3) If print data (or the space to the right of a character) extends beyond the print area before a command that involves a line feed (for example, LF or ESC J command) is received, a line feed is automatically executed in the print area, so that the mapping position of the print data is moved one line. The next mapping position will be the beginning of the line. In this case, the line feed width is as defined by a command such as ESC 2 or ESC 3.

(4) By default, the line feed width is 1/6 inch, which is equivalent to 34 dots. If the print data for the next line includes a vertically doubled or taller character, a downloaded bitmap image extending two or more lines, or a bar code taller than the character height, the data, therefore, falls short of the line feed width, causing the upper dots of the character to overlap the print data of the current line. The line feed width needs to be increased.

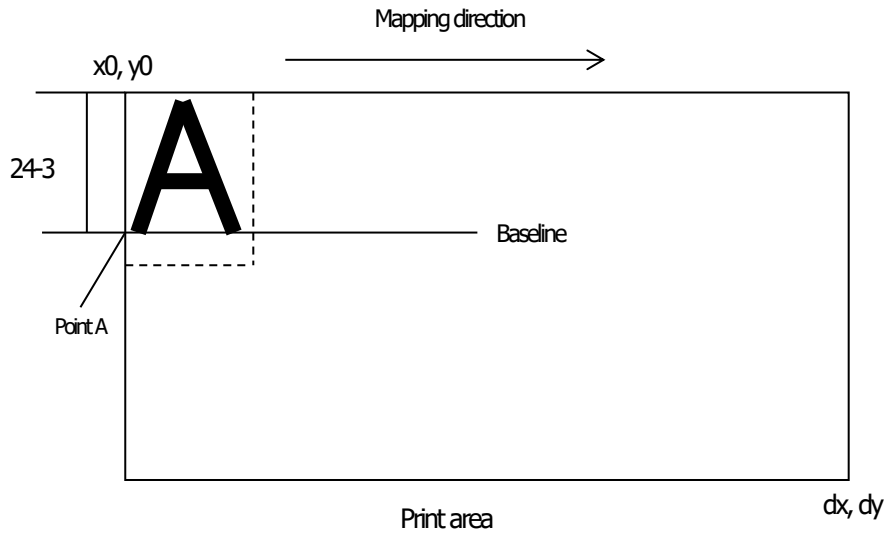


Figure 5-1 Mapping Position for Character Data

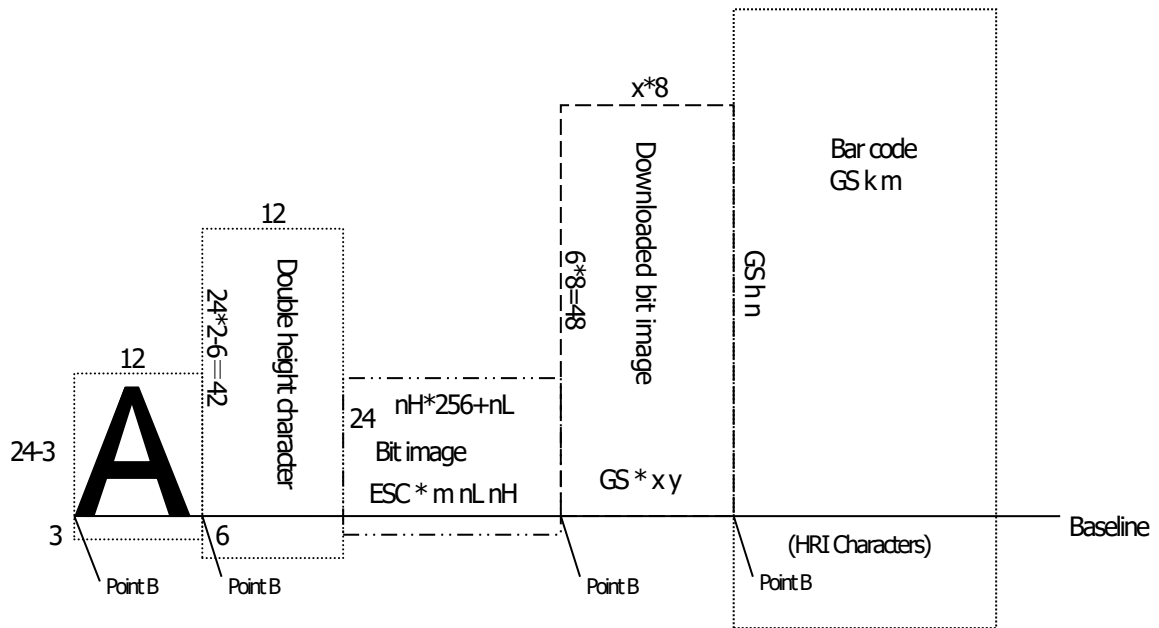


Figure 5-2 Mapping Positions for Print Data

### 5.1.4 Example of Using PAGE MODE

The following explains specific uses of PAGE MODE.

When in PAGE MODE, the commands are typically sent from the host to the printer in the following sequence:

- (1) An ESC L puts the printer in PAGE MODE.
- (2) An ESC W specifies the print area.
- (3) An ESC T specifies the print direction.
- (4) Print data is sent.
- (5) An FF instructs the printer to print the print data in a batch.
- (6) After printing, the printer returns to STANDARD MODE.

#### < Example 1 >

```
100 PRINT #1, CHR$(&H1B);"L";  
110 PRINT #1, CHR$(&H1B);"W";CHR$(0);CHR$(0);CHR$(0);CHR$(0);  
120 PRINT #1, CHR$(200);CHR$(0);CHR$(144);CHR$(1);  
130 PRINT #1, CHR$(&H1B);"T";CHR$(0);  
140 PRINT #1, "Page mode lesson Test1"  
150 PRINT #1, CHR$(&HC);
```

The program in Example 1 reserves a print area of 200 □□400 pitches extending from the start point (0, 0), and then prints the text "Page Mode lesson Test 1" on the first line of the print area as shown in Figure 5-3

"Example 1: Results of Print".

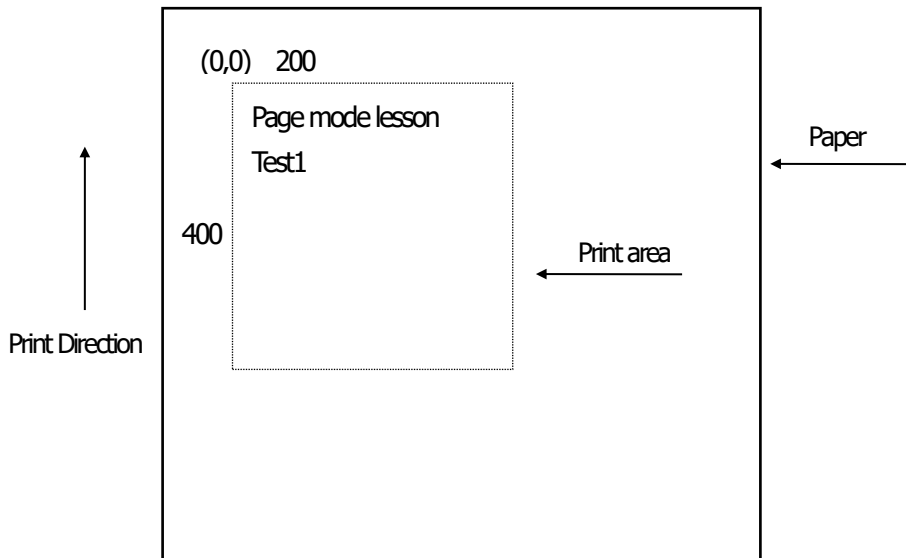


Figure 5-3 Example 1: Results of Print

In Figure 4-3, a line feed occurs between "Lesson" and "Test 1" because the space " " next to "Lesson" does not fit in the horizontal range of the 200 □□400-pitch print area. The line feed width conforms to the value specified by a command such as ESC 3.

It is possible to set as many print areas as desired before executing FF. If print areas overlap each other, the print area setup data are ORed with the previous data.

If you want to erase a section of mapped data, use the CAN command. The CAN command erases all data in the print area being specified. You can, therefore, use an ESC W to define a print area that encloses the section you want to erase, and then execute the CAN command, so that the section of the data is erased.

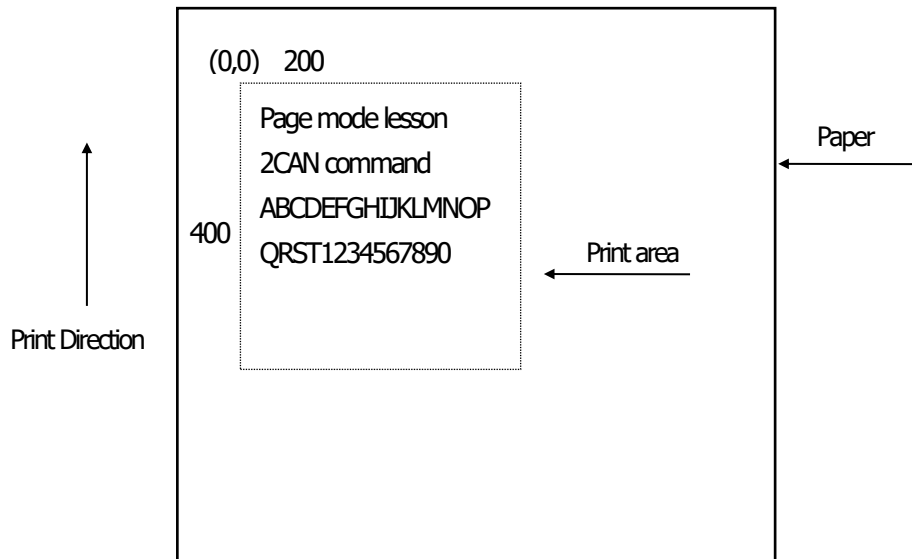
It is important to remember that any part of a character that overlaps with the specified print area will be erased.

**< Example 2 >**

```
100 PRINT #1, CHR$(&H1B);"L";
110 PRINT #1, CHR$(&H1B);"W";CHR$(0);CHR$(0);CHR$(0);CHR$(0);
120 PRINT #1, CHR$(200);CHR$(0);CHR$(144);CHR$(1);
130 PRINT #1, CHR$(&H1B);"T";CHR$(0);
140 PRINT #1, "Page mode lesson2CAN command";
150 PRINT #1, CHR$(&HA);
160 PRINT #1, "ABCDEFGHJKLMNOPQRST1234567890";
170 PRINT #1, CHR$(&HC);
```

First, an ESC L is sent to switch to PAGE MODE (100th line). Next, an ESC W is used to send eight arguments, n1 to n8, to reserve a print area. In this example, the arguments are sent in the sequence of 0, 0, 0, 0, 200, 0, 144, and 1, to reserve a print area that measures 200 from the start point (0, 0) in the "x" direction and 400 in the "y" direction (110th to 120th line). Furthermore, an ESC T is issued to specify the print direction to be "0" (130th line).

After the above setup, print data is sent (140th to 160th line). Finally, an FF is sent (170th line) to produce a print-out as shown in Figure 5-4 "Example 2: Result of Print".



**Figure 5-4 Example 2: Result of Print**

Before an FF is sent (170th line), the following program code can be added to remove part of the data.

**< Example 2 >**

```
180 PRINT#1, CHR$(&H1B);"W";CHR$(72);CHR$(0);CHR$(120);CHR$(0);
190 PRINT#1, CHR$(36);CHR$(0);CHR$(48)CHR$(0);
200 PRINT#1, CHR$(&H18);
```

As a result of the additional program code, a print-out is executed as shown in Figure 5-5 "Print Result of Adding a Program of Example 3 to Example 2", where the string "GHI" is removed.

When strings are removed with CAN, the area where the string would have been is not used by the rest of the data, instead it is converted into a sequence of spaces.

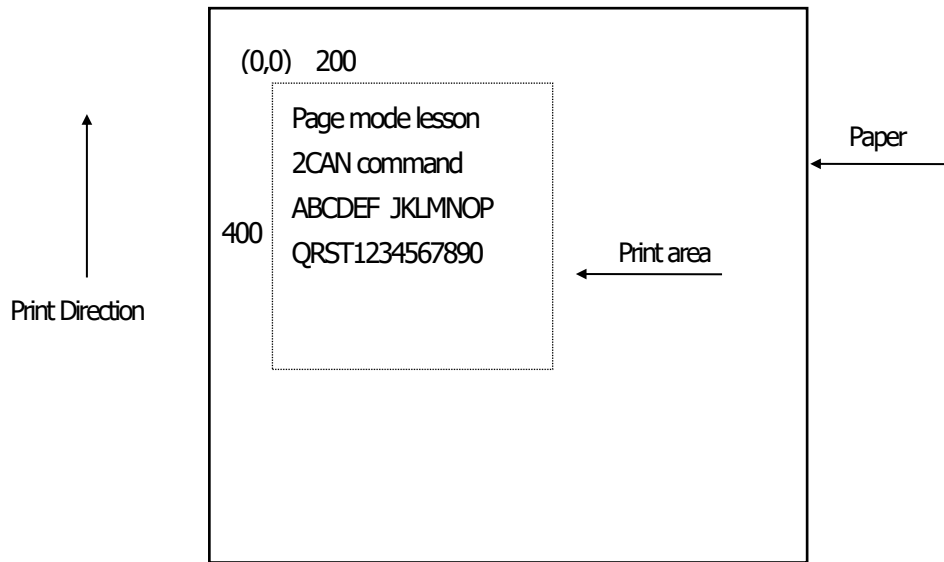


Figure 5-5 Print Result of Adding a Program of Example 3 to Example 2



### 5.3 Identification of Send Status

Because the status sent from the printer has certain fixed bits, it is possible to identify to which command the status belongs.

When using ASB (Automatic Status Back), however, the first byte of ASB should be checked, and then the three consecutive bytes except for XOFF should be treated as ASB data.

#### Identification of Send Status

Command and Function	Status
GS l	<0**0****>B
GS r	<0**0****>B
XON	<00010001>B
XOFF	<00010011>B
DLE EOT	<0**1**10>B
ASB (1st byte)	<0**1**00>B
ASB (2nd - 4th bytes)	<0**0****>B

