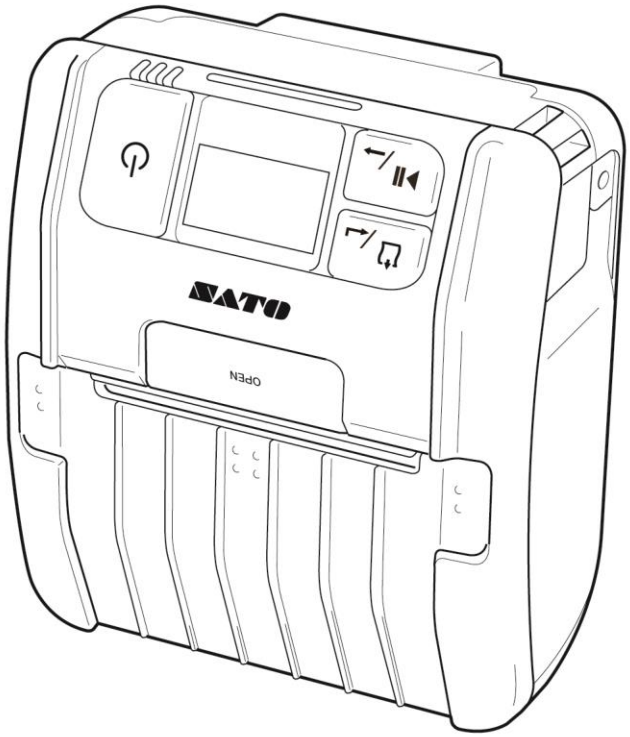
Barcode Printer

VP208

Programming Reference



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Version: VP208-r01-28-04-16PR

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Part 1 Programming Reference

1 Introduction

This is the SBPL command specification document for the mobile printer VP208.

Model			Installed fonts	Displayed language	FW version
International model	China model	CHN	Chinese font(GB18030)	Chinese	64.02.xx.xx
	Thai model	THA	-	English	
	Vietnam model	VNM	Vietnamese font	English	

Note:

- An international model will be shipped to 3 different destinations, China(CHN), Thailand(THA) and Vietnam(VNM).
- The OLED display language will be automatically determined by the fonts that are installed.

2 List of Commands

The following are the commands specified in the Specification for Command.
Yes: Available / No: Not available

Control

No.	Command		Function	CHN	THA	VNM	On page
6.1	ESC+A	<A>	Start Code	Yes	Yes	Yes	9
6.2	ESC+Z	<Z>	Stop Code	Yes	Yes	Yes	10
6.3	ESC+Q	<Q>	Print Quantity	Yes	Yes	Yes	11
6.4	ESC+ID	<ID>	Job ID Number	Yes	Yes	Yes	12
6.5	ESC+WK	<WK>	Job Name	Yes	Yes	Yes	13

Print Position

No.	Command		Function	CHN	THA	VNM	On page
7.1	ESC+H	<A>	Horizontal Print Position	Yes	Yes	Yes	14
7.2	ESC+V	<Z>	Vertical Print Position	Yes	Yes	Yes	15

Modification

No.	Command		Function	CHN	THA	VNM	On page
8.1	ESC+P	<P>	Character Pitch	Yes	Yes	Yes	16
8.2	ESC+L	<L>	Enlargement	Yes	Yes	Yes	17
8.3	ESC+PS	<PS>	Proportional Pitch	Yes	Yes	Yes	18
8.4	ESC+PR	<PR>	Release Proportional Pitch	Yes	Yes	Yes	19
8.5	ESC+%	<%>	Rotation (Fixed Base Reference Point)	Yes	Yes	Yes	20
8.6	ESC+F	<F>	Sequential Number	Yes	Yes	Yes	21
8.7	ESC+FW	<FW>	Ruled / Grid Line Print	Yes	Yes	Yes	22
8.8	ESC+(	<(>	Reverse Color Print	Yes	Yes	Yes	23

Font

No.	Command		Function	CHN	THA	VNM	On page
9.1	ESC+XU	<XU>	XU Font	Yes	Yes	Yes	24
9.2	ESC+XS	<XS>	XS Font	Yes	Yes	Yes	26
9.3	ESC+XM	<XM>	XM Font	Yes	Yes	Yes	28
9.4	ESC+XB	<XB>	XB Font	Yes	Yes	Yes	30
9.5	ESC+XL	<XL>	XL Font	Yes	Yes	Yes	32
9.6	ESC+OA	<OA>	OCR-A Font	Yes	Yes	Yes	34
9.7	ESC+OB	<OB>	OCR-B Font	Yes	No	No	36
9.8	ESC+K1	<K1>	16x16 dots Kanji in horizontal line	Yes	No	No	38
9.9	ESC+K2	<K2>	24x24 dots Kanji in horizontal line	Yes	No	No	39
9.10	ESC+K8	<K8>	16x16 dots Kanji in horizontal line with 1-byte character	Yes	No	No	40
9.11	ESC+K9	<K9>	24x24 dots Kanji in horizontal line with 1-byte character	Yes	No	No	41
9.12	ESC+k1	<k1>	16x16 dots Kanji in vertical line	Yes	No	No	42
9.13	ESC+k2	<k2>	24x24 dots Kanji in vertical line	Yes	No	No	43
9.14	ESC+k8	<k8>	16x16 dots Kanji in vertical line with 1-byte character	Yes	No	No	44
9.15	ESC+k9	<k9>	24x24 dots Kanji in vertical line with 1-byte character	Yes	No	No	45
9.16	ESC+C1	<C1>	16 x 16 dots Chinexe font in horizontal Line	Yes	No	No	46
9.17	ESC+C2	<C2>	24 x 24 dots Chinexe font in horizontal Line	Yes	No	No	47
9.18	ESC+C8	<C8>	16x16 dots Chinese font in horizontal line with 1-byte character	Yes	No	No	48
9.19	ESC+C9	<C9>	24x24 dots Chinese font in horizontal line with 1-byte character	Yes	No	No	49
9.20	ESC+c1	<c1>	16 x 16 dots Chinexe font in vertical Line	Yes	No	No	50
9.21	ESC+c2	<c2>	24 x 24 dots Chinexe font in vertical Line	Yes	No	No	51
9.22	ESC+c8	<c8>	16x16 dots Chinese font in vertical line with 1-byte character	Yes	No	No	52
9.23	ESC+c9	<c9>	24x24 dots Chinese font in vertical line with 1-byte character	Yes	No	No	53
9.24	ESC+XV1	<XV1>	XV1 Font	No	No	Yes	54
9.25	ESC+XV2	<XV2>	XV2 Font	No	No	Yes	55
9.26	ESC+XV3	<XV3>	XV3 Font	No	No	Yes	56

Barcode

No.	Command		Function	CHN	THA	VNM	On page
10.1	ESC+B	<B>	Barcode (Ratio 1:3)	Yes	Yes	Yes	62
10.2	ESC+D	<D>	Barcode (Ratio 1:2)	Yes	Yes	Yes	64
10.3	ESC+D to ESC+d	<D>~<d>	UPC-A Barcode (with HRI)	Yes	Yes	Yes	66
10.4	ESC+BD	<BD>	Barcode (Ratio 2:5)	Yes	Yes	Yes	67
10.5	ESC+BT	<BT>	Barcode Ratio Registration	Yes	Yes	Yes	69
10.6	ESC+BW	<BW>	Barcode Print by Specified Ratio	Yes	Yes	Yes	70
10.7	ESC+BI	<BI>	GS1-128 (UCC/EAN128)	Yes	Yes	Yes	73
10.8	ESC+BC	<BC>	CODE93 Barcode	Yes	Yes	Yes	75
10.9	ESC+BG	<BG>	CODE128 Barcode	Yes	Yes	Yes	77
10.10	ESC+BP	<BP>	POSTNET	Yes	Yes	Yes	81
10.11	ESC+BL	ESC+BL	UPC-A Barcode (without HRI)	Yes	Yes	Yes	83
10.12	ESC+BL to ESC+d	<D>~<d>	UPC-A Barcode (with HRI)	Yes	Yes	Yes	84
10.13	ESC+BM	<BM>	UPC-A Barcode (with HRI)	Yes	Yes	Yes	86

2D Barcode

No.	Command		Function	CHN	THA	VNM	On page
11.1	ESC+2D10	<2D10>	PDF417	Yes	Yes	Yes	87
11.2	ESC+2D12	<2D12>	Micro PDF	Yes	Yes	Yes	90
11.3	ESC+2D20	<2D20>	Maxicode	Yes	Yes	Yes	93
11.4	ESC+2D30	<2D30>	QR Code (Model 2)	Yes	Yes	Yes	95
11.5	ESC+2D31	<2D31>	QR Code (Model 1)	Yes	Yes	Yes	99
11.6	ESC+2D32	<2D32>	Micro QR Code	Yes	Yes	Yes	102
11.7	ESC+2D50	<2D50>	DataMatrix (ECC200)	Yes	Yes	Yes	107
11.8	ESC+2D51	<2D51>	GS1 DataMatrix	Yes	Yes	Yes	110

Graphic

No.	Command		Function	CHN	THA	VNM	On page
12.1	ESC+G	<G>	Graphic print	Yes	Yes	Yes	112
12.2	ESC+GM	<GM>	BMP File print	Yes	Yes	Yes	113

System

No.	Command		Function	CHN	THA	VNM	On page
13.1	ESC+CS	<CS>	Print Speed	Yes	Yes	Yes	114
13.2	ESC+#F	<#F>	Print Darkness	Yes	Yes	Yes	115
13.3	ESC+A1	<A1>	Media Size	Yes	Yes	Yes	117
13.4	ESC+A3	<A3>	Base Reference Point	Yes	Yes	Yes	119
13.5	ESC+*	<*>	Memory Clear	Yes	Yes	Yes	120
13.6	ESC+PG	<PG>	Register Printer Operation	Yes	Yes	Yes	121
13.7	ESC+PC	<PC>	Register Printer Operation	Yes	Yes	Yes	123
13.8	ESC+E	<E>	Auto Line Feed	Yes	Yes	Yes	125
13.9	ESC+I0	<I0>	Delete paring information	Yes	Yes	Yes	126
13.10	ESC+IL	<IL>	Specify time for Bluetooth power save mode	Yes	Yes	Yes	127
13.11	ESC+IE	<IE>	Disconnection timeout settings at power off	Yes	Yes	Yes	128
13.12	ESC+CE	<CE>	Codepage	Yes	Yes	Yes	129
13.13	ESC+TW	<TW>	Option Standby Time	Yes	Yes	Yes	130
13.14	ESC+TK	<TK>	Forced Tear Off	Yes	Yes	Yes	131
13.15	ESC+BU	<BU>	Buzzer setting	Yes	Yes	Yes	132
13.16	ESC+QS	<QS>	Reprint on error	Yes	Yes	Yes	133
13.17	ESC+NR	<NR>		Yes	Yes	Yes	134

Memory（FROM）

No.	Command		Function	CHN	THA	VNM	On page
14.1	ESC+CC	<CC>	Specify user area	Yes	Yes	Yes	135
14.2	ESC+FM	<FM>	Memory Initilalization	Yes	Yes	Yes	136
14.3	ESC+FP	<FP>	Memory Status Print	Yes	Yes	Yes	137
14.4	ESC+&S	<&S>	Form Overlay Registration	Yes	Yes	Yes	138
14.5	ESC+&R	<&R>	Form Overlay Call	Yes	Yes	Yes	140
14.6	ESC+YS	<YS>	Format Registration	Yes	Yes	Yes	141
14.7	ESC+/N	</N>	Registration of Field	Yes	Yes	Yes	144
14.8	ESC+YR	<YR>	Format Call	Yes	Yes	Yes	145
14.9	ESC+/D	</D>	Print of Field	Yes	Yes	Yes	146
14.10	ESC+GI	<GI>	Registration of Graphic	Yes	Yes	Yes	147
14.11	ESC+GR	<GR>	Graphic Call	Yes	Yes	Yes	148
14.12	ESC+GT	<GT>	BMP File Registration	Yes	Yes	Yes	149
14.13	ESC+GC	<GC>	BMP File Call	Yes	Yes	Yes	150
14.14	ESC+T1	<T1>	Memory 16x16 dots External Font Registration	Yes	No	No	151
14.15	ESC+T2	<T2>	Memory Card 24x24 dots External Font Registration	Yes	No	No	153
14.16	ESC+K1 (K2)	<K1(K2)>	Horizontal Writing External Font Call	Yes	No	No	155
14.17	ESC+k1 (k2)	<k1(k2)>	Vertical Writing External Font Call	Yes	No	No	156
14.18	ESC+*	<*>	Memory Clear	Yes	Yes	Yes	157

Intelligent Command

No.	Command		Function	CHN	THA	VNM	On page
15.1	ESC+IK	<IK>	Label Feed Control	Yes	Yes	Yes	158
15.2	ESC+IU	<IU>	Specify internal buzzer	Yes	Yes	Yes	160

3 Initial Value of Operation Settings

The initial values of operation setting are as follows:

Item	8 dots/mm
Print speed	4 inch/s Range: 4, 5, 6
Range of print darkness	A
Print darkness	5 Range: 1, 2, 3, 4, 5,6,7,8,9,10
Start point correction	+ 0
Designation of proportional pitch	Proportional pitch

4 List of Font

When using internal fonts, specify [ESC + Command of Font Types].

Yes : Available /No : Not available

Font name	Font type	Font size	Pitch	CHN	THA	VNM
OA	Bitmap [OCR-A font]	15×22 dots	Fixed	Yes	Yes	Yes
OB	Bitmap [OCR-B font]	20×24 dots	Fixed	Yes	Yes	Yes
XU	Bitmap [XU font]	5× 9 dots	Fixed	Yes	Yes	Yes
XS	Bitmap [XS font]	17×17 dots	Fixed / Proportional	Yes	Yes	Yes
XM	Bitmap [XM font]	24×24 dots	Fixed / Proportional	Yes	Yes	Yes
XB	Bitmap [XB font]	48×48 dots	Fixed / Proportional	Yes	Yes	Yes
XL	Bitmap [XL font]	48×48 dots	Fixed / Proportional	Yes	Yes	Yes
K1(k1)	Bitmap [K1 font]	16×16 dots	Fixed	Yes	No	No
K2(k2)	Bitmap [K2 font]	24×24 dots	Fixed	Yes	No	No
K8(k8)	Bitmap [K8 font]	16×16 dots	Fixed	Yes	No	No
K9(k9)	Bitmap [K9 font]	24×24 dots	Fixed	Yes	No	No
C1(c1)	Bitmap [C1 font] Chinese character font	16×16 dots	Fixed	Yes	No	No
C2(c2)	Bitmap [C2 font] Chinese character font	24×24 dots	Fixed	Yes	No	No
C8(c8)	Bitmap [C8 font] Chinese character font	16×16 dots	Fixed	Yes	No	No
C9(c9)	Bitmap [C9 font] Chinese character font	24×24 dots	Fixed	Yes	No	No
XV1	Bitmap [XV1 font]	9x9 dots	Fixed / Proportional	No	No	Yes
XV2	Bitmap [XV2 font]	16x16 dots	Fixed / Proportional	No	No	Yes
XV3	Bitmap [XV3 font]	24x24 dots	Fixed / Proportional	No	No	Yes

Expanded font

Font can be expanded by a factor of 1 to 12.
Internal bitmap fonts can also be expanded with a factor of 1 to 12.
Example: A font in a size of 5 dots of width and 9 dots of height is expanded by a factor of 3. The resulting font has a width of 15 dots and a height of 27 dots.
The input of expansion factors (height x expansion factor, width x expansion factor) for characters to be printed is done as described below:

Width x expansion factor= width parameter setting value
Height x expansion factor= height parameter setting value

The command <L> decides the expansion of the character. This parameter is set as factor.
Example: If setting the factor to: <L>0304, the character is expanded by a factor of 3 in horizontal direction (width) and a factor of 4 in vertical direction (height)
If an expansion factor is specified, also the pitch between the characters is automatically determined.

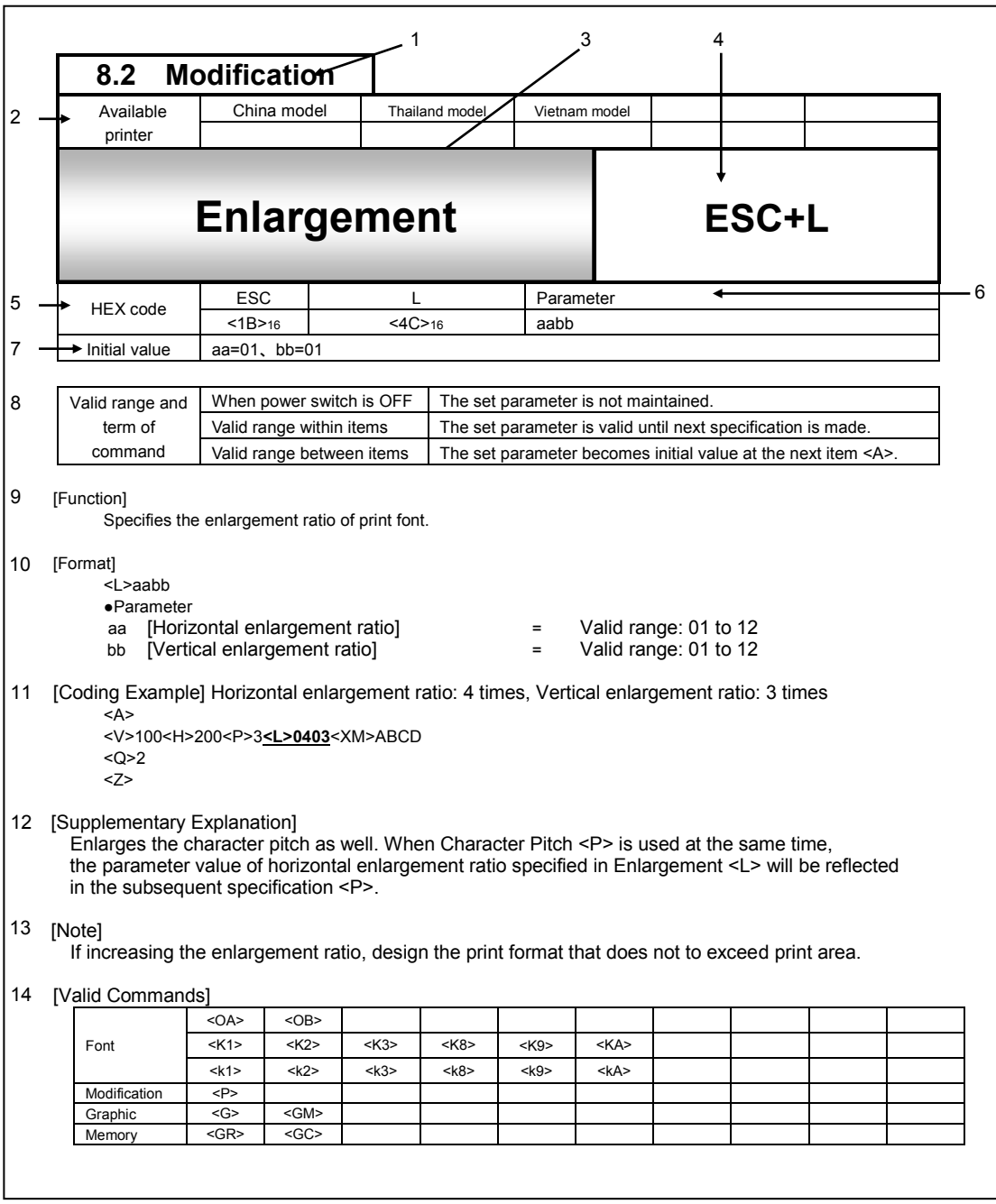
Fixed pitch / proportional pitch

For the XU-XL font, it is possible to select between the fixed and the proportional pitch on Font Setting mode. Setting and release of the proportional pitch is done as follows: Setting: <PS>, Release: <PR>.
Depending on the font type, the width of the proportional pitch does differ. Kata-kana is not affected by the proportional pitch, but the side space of characters will be narrowed.
At the fixed pitch, the character width is according to the relevant font size selected.

Difference between bitmap font

Regarding the bitmap font, the height and the width of the font are predefined. The height of the bitmap font is a little bit larger than the width.
The bitmap font is the largest in the font matrix.
For the font type and size refer to the font list on the previous page.

5 Example of Command Reference



1 3 4

8.2 Modification

2

Available printer	China model	Thailand model	Vietnam model		

Enlargement **ESC+L**

5 6

HEX code	ESC	L	Parameter
	<1B>16	<4C>16	aabb

7

Initial value	aa=01、bb=01

8

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until next specification is made.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

9 [Function]

Specifies the enlargement ratio of print font.

10 [Format]

<L>aabb

●Parameter

aa [Horizontal enlargement ratio] = Valid range: 01 to 12

bb [Vertical enlargement ratio] = Valid range: 01 to 12

11 [Coding Example] Horizontal enlargement ratio: 4 times, Vertical enlargement ratio: 3 times

<A>

<V>100<H>200<P>3**<u><L>0403</u>**<XM>ABCD

<Q>2

<Z>

12 [Supplementary Explanation]

Enlarges the character pitch as well. When Character Pitch <P> is used at the same time, the parameter value of horizontal enlargement ratio specified in Enlargement <L> will be reflected in the subsequent specification <P>.

13 [Note]

If increasing the enlargement ratio, design the print format that does not to exceed print area.

14 [Valid Commands]

Font	<OA>	<OB>								
	<K1>	<K2>	<K3>	<K8>	<K9>	<KA>				
	<k1>	<k2>	<k3>	<k8>	<k9>	<kA>				
Modification	<P>									
Graphic	<G>	<GM>								
Memory	<GR>	<GC>								

1. Indicates the classification of commands such as:
[Control], [Print Position], [Modification], [Font], [Barcode], [2D code], [Graphic], [System], [Memory], [Extended Function]

2. Command availability / unavailability depending on printer model
If command is not available: [ ] will be indicated.

Example) Commands only available for the China model as shown below.

Available printer	China model	Thailand model	Vietnam model		

3. Indicates command name.

4. Indicates command code.

5. Indicates command in HEX code.

6. Indicates parameter to be described in command.

7. Indicates initial value for command.

8. Indicates valid range of command.
   When power switch is OFF;
   1) The set parameter is maintained.
   2) The set parameter is not maintained.
   3) The set command is not maintained.

   Valid range within items;
   1) The set parameter is valid until the next specification is made.
   2) The set parameter becomes invalid.
   3) The set command becomes invalid.

   Valid range between items;
   1) The set parameter becomes initial value at the next item <A>.
   2) The set parameter is valid until the next specification is made.
   3) The set parameter becomes invalid.
   4) The set command becomes invalid.

9. Explains the function of command.

10. Explains the command and required parameter.
    <L>AABB indicates the command ESC+L(<1B>16<4C>16) and two types of parameters such as "aa" and "bb".

11. Shows the example of how to use the commands.

12. Provides the supplemental information of command function and parameter.

13. Provides notes and restriction for the use of command.

14. Describes the commands that will be affected by used commands.

6 Control Command

6.1 Control

Available printer	China model	Thailand model	Vietnam model		

Start Code	ESC+A

HEX code	ESC	A	Parameter
	<1B>16	<41>16	Nil
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]
Specifies the start of data transmission.

[Format]
<A>

[Coding Example]
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]
1. Indicates the start of item and to be placed at the head of item.
2. Use <A> and End of Data Transmission <Z> as a pair of commands.

[Note]
1. Setting value of all commands excluding a part of system commands will be set to default.
2. If this command is not specified, printing will not be performed.

6.2 Control

Available printer	China model	Thailand model	Vietnam model		

Stop Code	ESC+Z

HEX code	ESC	Z	Parameter
	<1B>16	<5A>16	Nil
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]
Specifies the end of data transmission.

[Format]
<Z>

[Coding Example]
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]
1. Indicates the end of item and to be placed at the tail of item.
2. Use Start of Data Transmission <A> and <Z> as a pair of commands.

[Note]
If this command is not specified, printing will not be performed.

6.3 Control

Available printer	China model	Thailand model	Vietnam model		

Print Quantity

ESC+Q

HEX code	ESC	A	Parameter
	<1B>16	<51>16	aaaaaa
Initial value	aaaaaa=1		

Valid range and term of command	When power switch is OFF	The set command is not maintained.
	Valid range within items	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifies the number of labels to print.

[Format]

<Q>aaaaaa

●Parameter

a [Number of labels to print] = Valid range: 1 to 999999

[Coding Example]

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

[Supplementary Explanation]

1. Print contents specified by Start of Data Transmission <A> and End of Data Transmission <Z> are regarded as 1 label, and the number of reprints can be specified.
2. Use this command prior to end of data transmission command <Z>.

[Note]

1. Reprint will be performed based on the specified print quantity. If specifying sequential numbering command <F>, the value of sequential number that was set up for that field portion will print.

6.4 Control

Available printer	China model	Thailand model	Vietnam model		

Job ID Number	ESC+ID

HEX code	ESC	ID	Parameter
	<1B>16	<49>16<44>16	aa
Initial value	a=<20>16		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies job ID number for status return.

[Format]

<ID>aa

●Parameter

a [Job ID number] = Valid range: 00 to 99

[Coding Example] Job ID number: 01

<A>
<ID>01
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<Q>2
<Z>

[Supplementary Explanation]

1. When status return is used for interface protocol, the specified job ID No. can be set to the telegraphic status.
2. Status can be confirmed sending status request (ENQ).
3. Include this command within items and use between start code <A> and stop code <Z>.

[Note]

1. In status return interface protocol, this command becomes valid when status request (ENQ) is received while printing (QTY≠0, includes at the time of Offline and Error).
2. In status return interface protocol, if status request (ENQ) is received when printing is not in progress (QTY=0, No received data when power is ON), space (20H) will be set to status and returned.
3. When Job ID Number <ID> is used more than twice within the items of <A> and <Z>, the last specified value becomes valid.
4. For more information, refer to the “Interface Specification”.

6.5 Control

Available printer	China model	Thailand model	Vietnam model		

Job Name	ESC+WK

HEX code	ESC	WK	Parameter
	<1B>16	<57>16<4B>16	aaaaaaaaaaaaaaaa
Initial value	aaaaaaaaaaaaaaaa =<20>16		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies job name for status return.

[Format]
<WK>aaaaaaaaaaaaaaaa

●Parameter
a [Job Name] = ASCII code 16-digit, Shift JIS Kanji 8-digit

[Coding Example] Job name: SATO
<A>
<ID>01
<WK>SATO
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<Q>2
<Z>

[Supplementary Explanation]
1. When Status4 is used for interface protocol, specified job name can be set to the telegraphic status.
2. Status can be confirmed sending status request (ENQ).
3. Include this command within items and use between start of data transmission <A> and end of data transmission <Z>.
4. This command can be used in combination with Job ID Number <ID>.

[Note]
1. In status return interface protocol, this command becomes valid when status request (ENQ) is received while printing (QTY≠0, includes at the time of Offline and Error).
2. In status return interface protocol, if status request (ENQ) is received when printing is not in progress (QTY=0, No received data when power is ON), space (20H) will be set to status and returned.
3. When Job ID Number <ID> is used more than twice within the items of <A> and <Z>, the last specified value becomes valid.
4. For more information, refer to the “Interface Specification”.

7 Print Position Command

7.1 Print Position

Available printer	China model	Thailand model	Vietnam model		

Horizontal Print Position	ESC+H

HEX code	ESC	H	Parameter
	<1B>16	<48>16	aaaa
Initial value	aaaa=1		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]
Specifies horizontal print position from its start point by dot.

[Format]
<H>aaaa

●Parameter
aaaa [Horizontal Print Position] = Refer to the table below.

[Coding Example] Horizontal print position: 200 dots
<A>
<V>100**<H>200**<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]
Specifies the start of horizontal position for the print of text, barcode, ruled line and graphic.

[Note]
Any contents such as text, barcode, or graphic which are exceeded printable area are not printed.

[Initial Value and Valid Range of Parameter]

Head density	Initial value	Valid range (dots)
8dot/mm (203dpi)	1	440

[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
	<XV1>*2	<XV2>*2	<XV3>*2							
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	
	<BP>	<BL>	<BL><d>	<BM>						
2D code	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D32>	<2D33>	<2D50>	<2D51>	
Modification	<FW>	<(>								
Graphic	<G>	<GM>								

*1 Only available for China model
*2 Only available for Vietnam model

Refer to the operator manual for further information of the setting.

7.2 Print Position

Available printer	China model	Thailand model	Vietnam model		

Vertical Print Position — ESC+V

HEX code	ESC	V	Parameter
	<1B>16	<56>16	aaaaa
Initial value	aaaaa=1		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]
Specifies vertical print position from its start point by dot.

[Format]
<V>aaaaa

●Parameter
a [Vertical Print Position] = Refer to the table below.

[Coding Example] Vertical print position: 100 dots
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]
Specifies the start of vertical position for the print of text, barcode, ruled line and graphics.

[Note]
Any contents such as text, barcode, or graphic which are exceeded printable area are not printed.

[Initial Value and Valid Range of Parameter]

Head density	Initial value	Valid range (dots)
8 dots/mm (203dpi)	1	8000

[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
	<XV1>*2	<XV2>*2	<XV3>*2							
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	
	<BP>	<BL>	<BL><d>	<BM>						
2D code	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D32>	<2D33>	<2D50>	<2D51>	
Modification	<FW>	<(>								
Graphic	<G>	<GM>								

*1 Only available for China model

*2 Only available for Vietnam model

8 Modification Command

8.1 Modification

Available printer	China model	Thailand model	Vietnam model		

Character Pitch	ESC+P

HEX code	ESC	P	Parameter
	<1B>16	<50>16	(a)bbb
Initial value	(a)bbb=002		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]
Specifies character pitch by dot.

[Format]
<P>(a)bbb

●Parameter

a	[sign]	=	Use only minus (-) sign. Omit the sign for plus value.
b	[Character pitch]	=	Valid range: -3 to 255 (dots)

[Coding Example] Character pitch: 10

```
<A>
<V>100<H>200<P>10<L>0202<XM>ABCD
<Q>2
<Z>
```

[Supplementary Explanation]

1. Character pitch means the character gap or font gap when selecting font or barcode.
2. Specified character pitch will be widened based on the ratio of Enlargement <L>.
3. Even if linefeed code [CR] is specified in Auto Linefeed <E>, it remains the same without returning to initial value. Start of Data Transmission <A> can be used to reset to the initial value.
4. By specifying Character Pitch <P> just before the barcode specification, pitch command becomes valid for barcode module.
   Object barcode: NW-7, CODE39, Industrial 2 of 5, Matrix 2 of 5
   For more information, see (3) Intercharacter gap in [10. Barcode Command].
5. Data specification except numeric value or specification of over-digit will give the initial value.

[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
	<XV1>*2	<XV2>*2	<XV3>*2							
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BM>			

*1 Only available for China model

*2 Only available for Vietnam model

8.2 Modification

Available printer	China model	Thailand model	Vietnam model		

Enlargement	ESC+L

HEX code	ESC	L	Parameter
	<1B>16	<4C>16	aabb
Initial value	aa=01, bb=01		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]
Specifies the enlargement ratio of font.

[Format]
<L>aabb

●Parameter
aa [Horizontal enlargement ratio] = Valid range: 01 to 12
bb [Vertical enlargement ratio] = Valid range: 01 to 12

[Coding Example] Horizontal enlargement ratio: 4 times, Vertical enlargement ratio: 3 times

```
<A>
<V>100<H>200<P>3<L>0403<XM>ABCD
<Q>2
<Z>
```

[Supplementary Explanation]
1. Enlarges the character pitch as well. When Character Pitch <P> is used at the same time, the parameter value of horizontal enlargement ratio specified in Enlargement <L> will be reflected in the subsequent specification <P>.

[Note]
If increasing the enlargement ratio, design the print format that does not exceed print area.

[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
	<XV1>*2	<XV2>*2	<XV3>*2							
Modification	<P>									
Graphic	<G>	<GM>								
Memory	<GR>	<GC>								

*1 Only available for China model

*2 Only available for Vietnam model

8.3 Modification

Available printer	China model	Thailand model	Vietnam model		

Proportional Pitch

ESC+PS

HEX code	ESC	PS	Parameter
	<1B>16	<50>16<53>16	Nil
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set command is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifies the proportional pitch.

[Format]

<PS>

[Coding Example]

<A>
<PS>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]

1. This command is not applicable to Kata-kana but to alphanumeric which becomes narrower than the time when <PS> was not specified.
2. If data other than specified is set, proportional print will not be performed.
3. Initial value is “Proportional pitch” enabled by <PS> command. Go to the Font setting of printer LCD or use Priner configuration tool to specify the default value (Fixed/Proportional).

[Valid Command]

Font	<XS>	<XM>	<XB>	<XL>	<XV1>*1	<XV2>*1	<XV3>*1			

*1 Only available for Vietnam model

8.4 Modification

Available printer	China model	Thailand model	Vietnam model		

Release Proportional Pitch	ESC+PR

HEX code	ESC	PR	Parameter
	<1B>16	<50>16<52>16	Nil
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set command is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifies the release of proportional pitch.

[Format]

<PR>

[Coding Example]

<A>
<PR>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Supplementary Explanation]

1. Initial value for is “Proportional pitch” enabled by <PS> command. Go to the Font setting of printer LCD or use Priner configuration tool to specify the default value (Fixed/Proportional).

[Valid Command]

Font	<XS>	<XM>	<XB>	<XL>	<XV1>*1	<XV2>*1	<XV3>*1			

*1 Only available for Vietnam model

8.5 Modificaition

Available printer	China model	Thailand model	Vietnam model		

Rotation	ESC+%

HEX code	ESC	%	Parameter
	<1B>16	<25>16	a
Initial value	a=0		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

[Function]

Specifies the counter-clockwise rotation of font and barcode.

[Format]

<%>a

●Parameter

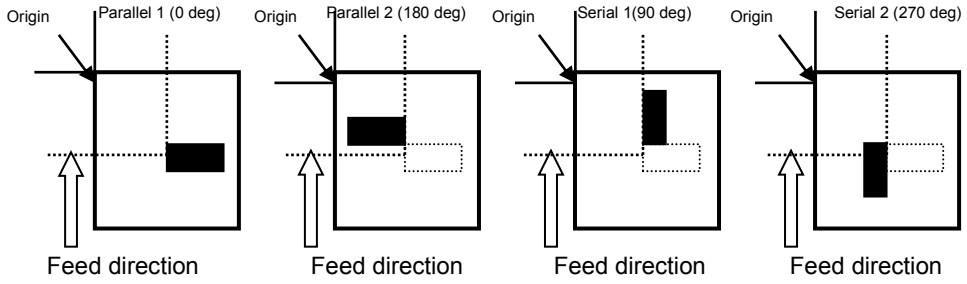
a [Rotative direction] = 0: Parallel 1 (0 degree)
1: Serial 1 (90-degree)
2: Parallel 2 (180-degree)
3: Serial 2 (270-degree)

[Coding Example] Font rotation: Parallel 2 (180-degree), Barcode rotation: 1: Serial 1 (90-degree)

<A>
<%>2
<V>100<H>400<P>3<L>0403<XM>ABCD
<%>1
<V>400<H>200<BD>103160*123*
<Q>2
<Z>

[Supplementary Explanation]

1. Position specification of Vertical Print Position <V> and Horizontal Print Position <H> are the absolute value from its base reference point.
2. When the value of parameter “a” is between 4 and 9, it will be processed as a command error and ignored. When the value other than numeric is specified, this will be ignored and printing at 0 degree.
3. Print of barcode using Serial 1 or Serial 2 may cause blur. Drop the print speed for rotation print of Serial 1 and Serial 2 for better performance.



[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
	<XV1>*2	<XV2>*2	<XV3>*2							
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	
	<BP>	<BL>	<BL><d>	<BM>						
2D code	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D32>	<2D33>	<2D50>	<2D51>	
Graphic	<G>	<GM>								
System	<E>									
Modification	<FW>	<(>								
Memory	<GR>	<GC>								

*1 Only available for China model

*2 Only available for Vietnam model

8.6 Modification

Available printer	China model	Thailand model	Vietnam model		

Sequential Number

ESC+F

HEX code	ESC	F	Parameter
	<1B>16	<46>16	aaaabcccc(,dd,ee,f)
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies prior to the data specification command of font or barcode, and printing specified data in a sequential order.

[Format]

<F>aaaabcccc,dd,ee,f

●Parameter

a [Print quantity specification of identical contents] = Valid range : 1 to 9999
b [Increasing and decreasing specification] = + : Addition
= - : Subtraction
c [Setting of increasing and decreasing value] = Valid range : 1 to 9999
d [Valid digit number for sequential number] = Valid range : 1 to 99 When omitted 8 (omissible)
e [Low-order invalid digit number] = Valid range : 0 to 99 When omitted 0 (omissible)
f [Specification of Decimal/Hex sequential number] = 0 : Decimal number When omitted 0 (omissible)
1 : Hexadecimal

[Coding Example] Print quantity specification of identical contents: 1, Increasing and decreasing specification: +
Setting of increasing and decreasing value: 1, Valid digit number for sequential number: 5
Low-order invalid digit number: 0

```
<A>
<V>100<H>100<P>2<L>0202
<F>1+1,5,0<XU>10000
<Q>2
<Z>
```

[Supplementary Explanation]

1. Sequential number can be specified up to 8 points per format.
2. Next print data from <F> command will be the initial value of sequential number.
3. Specify the required number of digits for sequential number to print it properly.
4. Specification of Black/White Reverse Print <(> is not valid for sequential numbered data.
(When “Black/White Reverse Print” command and “Sequential number” command are sent at the same time, “Black/White Reverse Print” will be executed.)
5. Auto Linefeed <E> is not available.
6. Need to print font or barcode to print sequential number.
7. Digit number of sequential number should correspond to that of font/barcode data command.
If the digit number of sequentilal number is larger, sequential number printing will not be performed.
8. When the data immediate after <F> become the sequencial number invalid command, the sequential number becomev invalid.

[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<XV1>*1	<XV2>*1	<XV3>*1							
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	
	<BP>	<BL>	<BL><d>	<BM>						

*1 Only available for Vietnam model

8.7 Modification

Available printer	China model	Thailand model	Vietnam model		

Ruled / Grid Line Print

ESC+FW

HEX code	ESC	FW	Parameter
	<1B>16	<46>16<57>16	Rule aabccccc(Peeeeeeee) Grid aabbvccccchddddd(Peeeeeeee)
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies the ruled / grid line.

[Format]
<FW>aabccccc(Peeeeeeee)
●Parameter

a	[Line width]	=	Valid range	:	02 to 99 dots
b	[Horizontal/vertical direction]	=	H	:	Horizontal direction
		=	V	:	Vertical direction
c	[Ruled line length]	=	Valid range	:	Refer to the table below.
e	[Ruled line pattern]	=	Valid range	:	01 to FFFFFFFF(Ommisible)

<FW> aabbVcccccHddddd(Peeeeeeee)
●Parameter

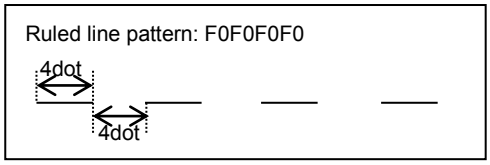
a	[Vertical line width]	=	Valid range	:	02 to 99 dots
b	[Horizontal line width]	=	Valid range	:	02 to 99 dots
c	[Vertical line length]	=	Valid range	:	Refer to the table below.
d	[Horizontal line length]	=	Valid range	:	Refer to the table below.
e	[Grid line pattern]	=	Valid range	:	01 to FFFFFFFF(Ommisible)

[Coding Example 1] Ruled line print, Line width: 4, Horizontal direction, Ruled line length: 400
Grid line print, Vertical line width: 8, Horizontal line width: 8,
Vertical line length: 300, Horizontal line length: 400

<A>
<V>100<H>200**<FW>04H400**
<V>300<H>200**<FW>0808V300H400**
<Q>2
<Z>

[Coding Example 2] Ruled line print, Line width: 4, Horizontal direction, Ruled line length: 400,
Ruled line pattern:F0F0F0F0, Grid line print, Vertical line width: 8, Horizontal line width: 8,
Vertical line length: 300, Horizontal line length: 400, Ruled line pattern: F0F0F0F0

<A>
<V>100<H>200**<FW>04H400PF0F0F0F0**
<V>300<H>200**<FW>0808V300H400PF0F0F0F0**
<Q>2
<Z>



[Supplementary Explanation]
1. When the print start position is outside of printable area, printing will not be performed due to command error.
2. Set line width according to the table below so the horizontal line width is more than 0.166mm.

Head density	Line width
8 dots/mm (203dpi)	2 dots or more

3. If setting the vertical line width wider, it will be widened to the right side against media feed direction. If setting the horizontal line width wider, it will be widened to the lower side against media feed direction.
4. If setting the glid line wider, it will be widened inward.
5. Specify 8-bit pattern for ruled line (1 digit = 4 bits, 1 bit = 1 dot)
6. When ruled line pattern is less than 8 digits, the pattern data will be created by repeating the specified data until it gets 8-digit data.
e.g.) When ruled line pattern is "F0C", the created pattern will be "F0CF0CF0".
7. When specifying pattern, drawing area will be generated by unit of 4 bytes. If the print start point is not specified by the unit of 4 bytes, the drawing will shift one dot because the pattern will be generated from the middle.

[Valid Range]

Head density	Valid range (dot)	
	Horizontal line length	Vertical line length
8 dots/mm (203dpi)	1 to 440	1 to 8000

Refer to the operator manual for further information of the setting.

8.8 Modification

Available printer	China model	Thailand model	Vietnam model		

Reverse Color Print	ESC+(

HEX code	ESC	(	Parameter
	<1B>16	<28>16	aaaaa,bbbbb
Initial value	Nil		

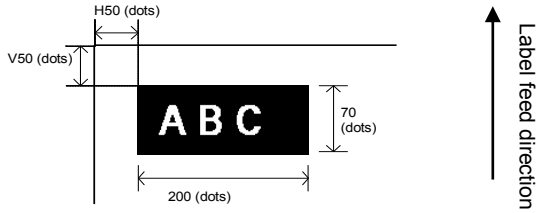
Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies black and white reverse print.

[Format]
<(>aaaaa,bbbbb

●Parameter
a [Specification of reverse area in horizontal direction] = Valid range: Refer to the table below
b [Specification of reverse area in vertical direction] = Valid range: Refer to the table below

[Coding Example] Reverse area in horizontal direction: 200, Reverse area in vertical direction: 70
<A>
<V>50<H>50<P>2<L>0202<XM>ABC
<V>50<H>50**<(>200,70**
<Q>2
<Z>



[Supplementary Explanation]
1. Set this command next after the firm data string to be inversed. If it is set prior to the firm data the data will be printed in black without inverse.
2. To set print start position, specify Horizontal Print Position <H> and Vertical Print Position <V> prior to this command.
3. When the print start position is outside of printable area, printing will not be performed due to command error.

[Note]
1. For setting, keep the black print area under 30% of overall label.

[Valid Range]

Head density	Valid range (dots)	
	Reverse area in horizontal direction	Reverse area in vertical direction
8 dots/mm (203dpi)	8 to 440	8 to 8000

Refer to the operator manual for further information of the setting.

9 Font command

9.1 Font

Available printer	China model	Thailand model	Vietnam model		

XU Font (Basic size 5x9 dots)	ESC+XU

HEX code	ESC	XU	Parameter
	<1B>16	<58>16<55>16	n - n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Font with the basic size of: width 5 dots, height 9 dots is specified.

[Format]
<XU>n ~ n
● Parameter
n [Print data] = Data

[Coding example]
<A>
<V>100<H>200<P>2<L>0304**<XU>ABCDE**
<Q>2
<Z>

[Notes]
1. The XU font allows the setting of a fixed pitch only.
2. The character set varies according to setting of <CE> command.

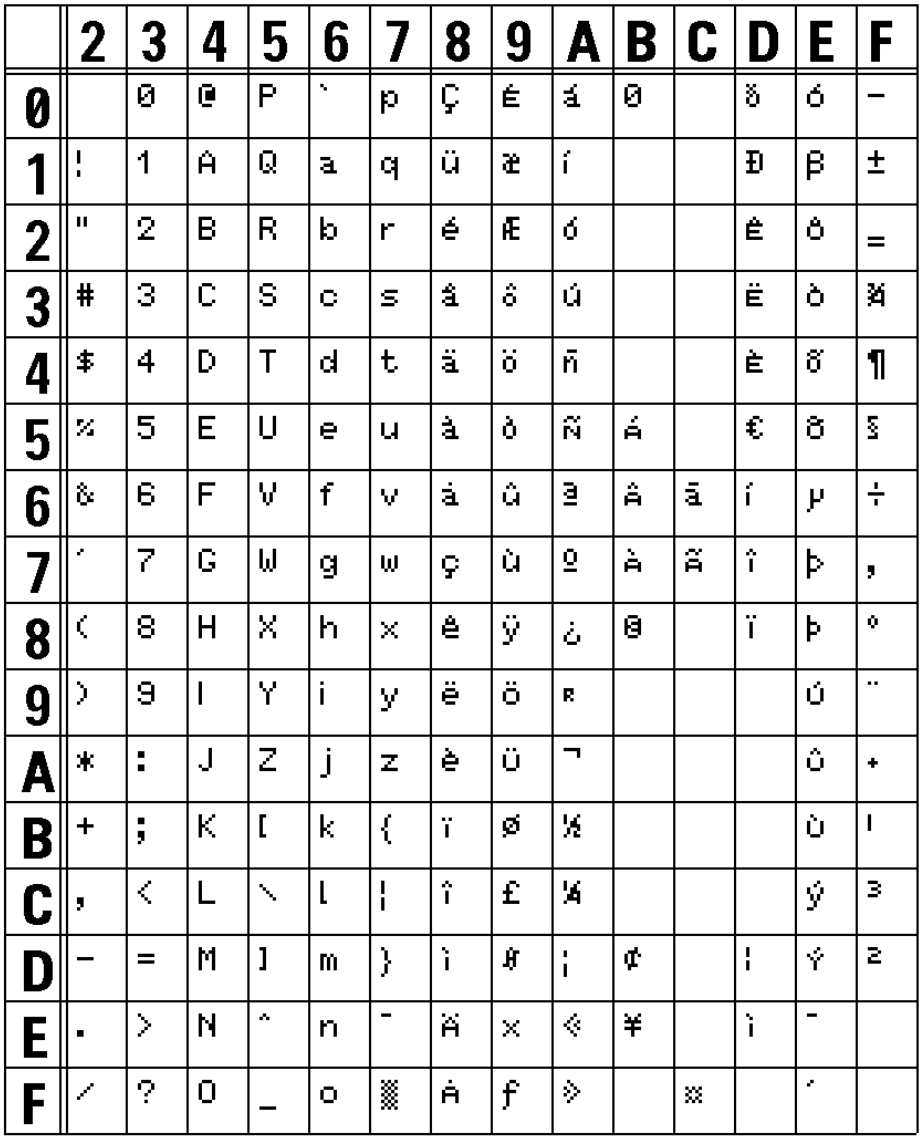
[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<F>						
Barcode	<D><d>	<BL><d>								

XU font character set

Basic size is 5 x 9 dots (width x height)

XU FONT(L0303) 203DPI



The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 3 (vertical/horizontal) and DOS 858.

9.2 Font

Available printer	China model	Thailand model	Vietnam model		

XS Font (Basic size 17x17 dots)

ESC+XS

HEX code	ESC	XS	Parameter
	<1B>16	<58>16<53>16	n~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 17 dots, height 17 dots is specified.

[Format]

<XS>n - n

● Parameter

n [Print data] = Data

[Coding example]

<A>
<V>100<H>200<P>2<L>0304**<XS>ABCDE**
<Q>2
<Z>

[Supplementary Explanation]

1. The XS font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.
3. The character set varies according to setting of <CE> command.

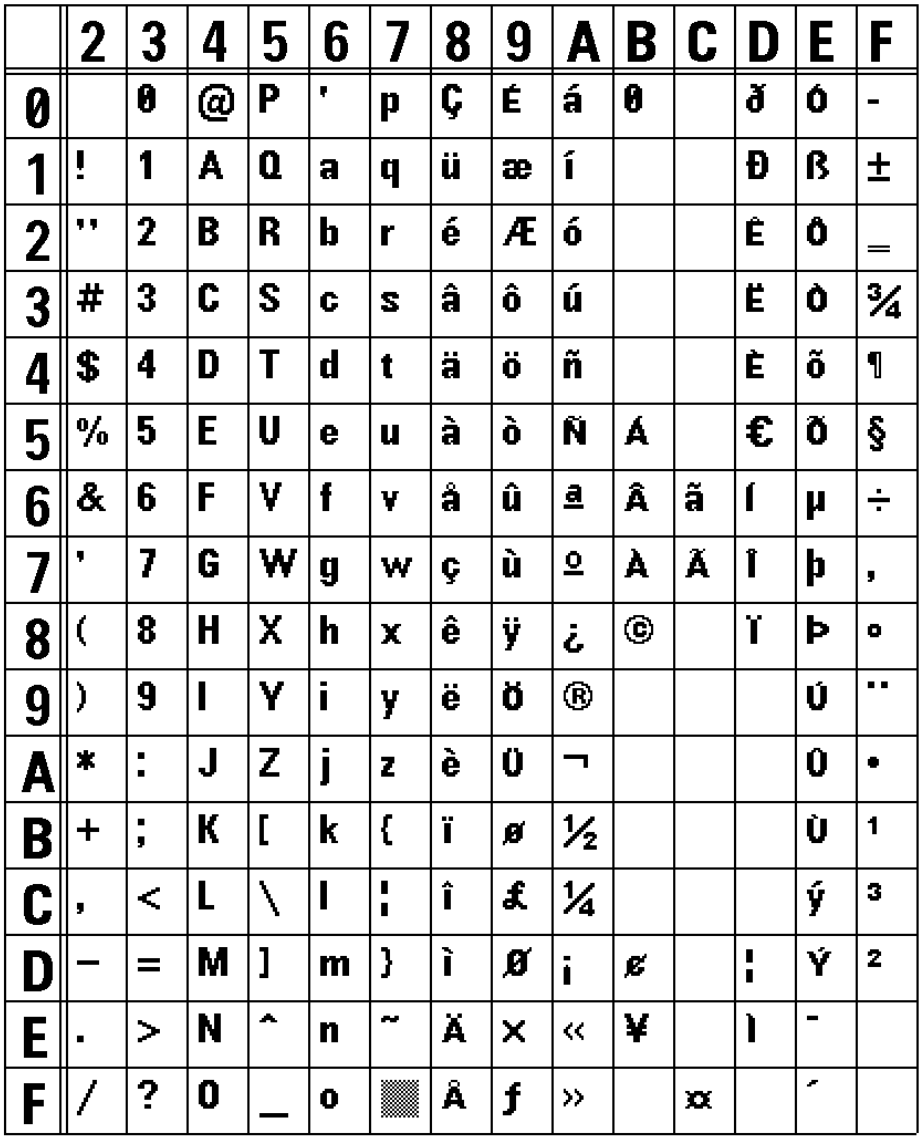
[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

XS font character set

Basic size is 17 x 17 dots (width x height)

XS FONT(L0202) 203DPI



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

The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 2 (vertical/horizontal) and DOS 858.

9.3 Font

Available printer	China model	Thailand model	Vietnam model		

XM Font (Basic size 24x24 dots)

ESC+XM

HEX code	ESC	XM	Parameter
	<1B>16	<58>16<4D>16	n~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 24 dots, height 24 dots is specified.

[Format]

<XM>n - n

● Parameter

n [Print data] = Data

[Coding example]

<A>
<V>100<H>200<P>2<L>0304**<XM>ABCDE**
<Q>2
<Z>

[Supplementary Explanation]

1. The XM font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.
3. The character set varies according to setting of <CE> command.

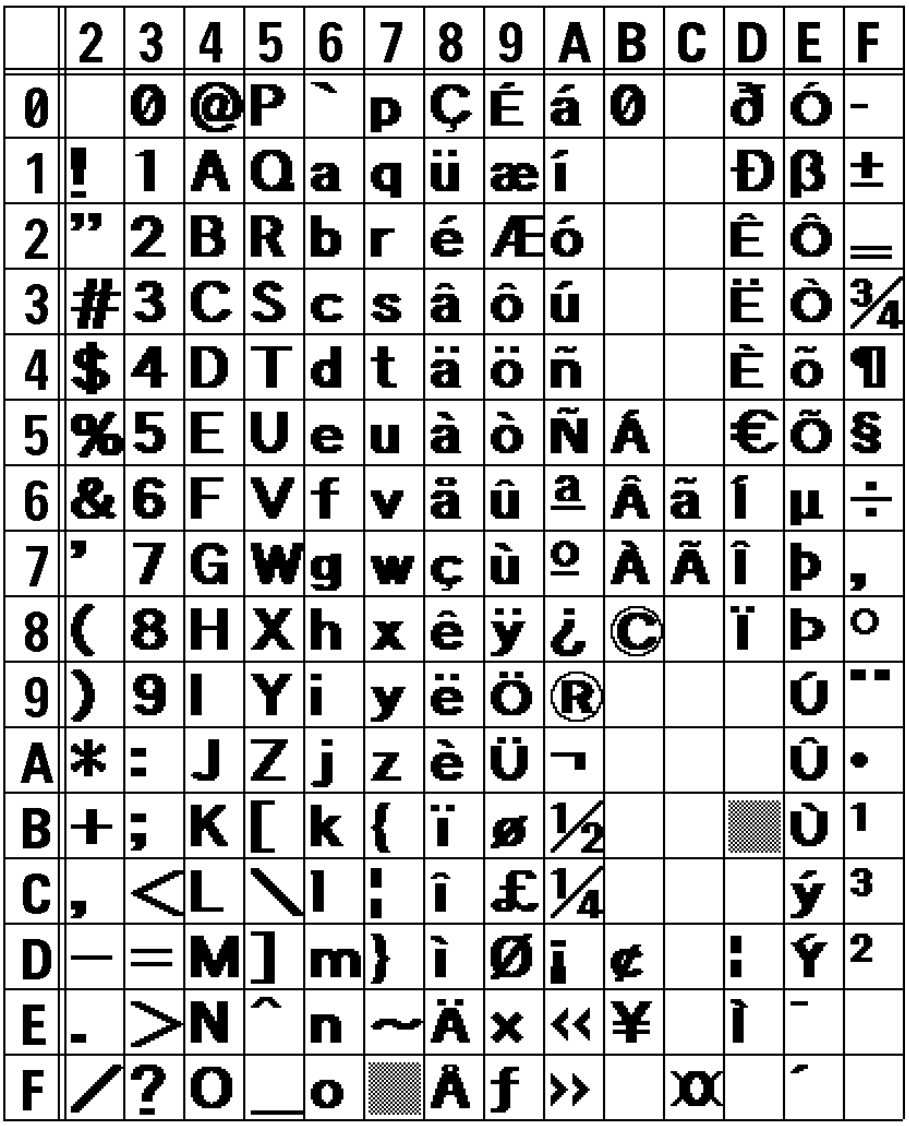
[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

XM font character set

Basic size is 24 x 24 dots (width x height)

XM FONT(L0202) 203DPI



The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 2 (vertical/horizontal) and DOS 858.

9.4 Font

Available printer	China model	Thailand model	Vietnam model		

XB Font (Basic size 48x48 dots)

ESC+XB

HEX code	ESC	XB	Parameter
	<1B>16	<58>16<42>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Font with the basic size of: width 48 dots, height 48 dots is specified.

[Format]

<XB>an~n

● Parameter

a [Smoothing] = 0 : Smoothing OFF
= 1 : Smoothing ON
(Only available if expansion factor is between 3 and 12)

n [Print data] = Data

[Coding example]

<A>
<V>100<H>200<P>2<L>0304**<XB>0ABCDE**
<Q>2
<Z>

[Supplementary Explanation]

1. The XB font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.
3. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2, the smoothing function will be ignored.
4. The character set varies according to setting of <CE> command.

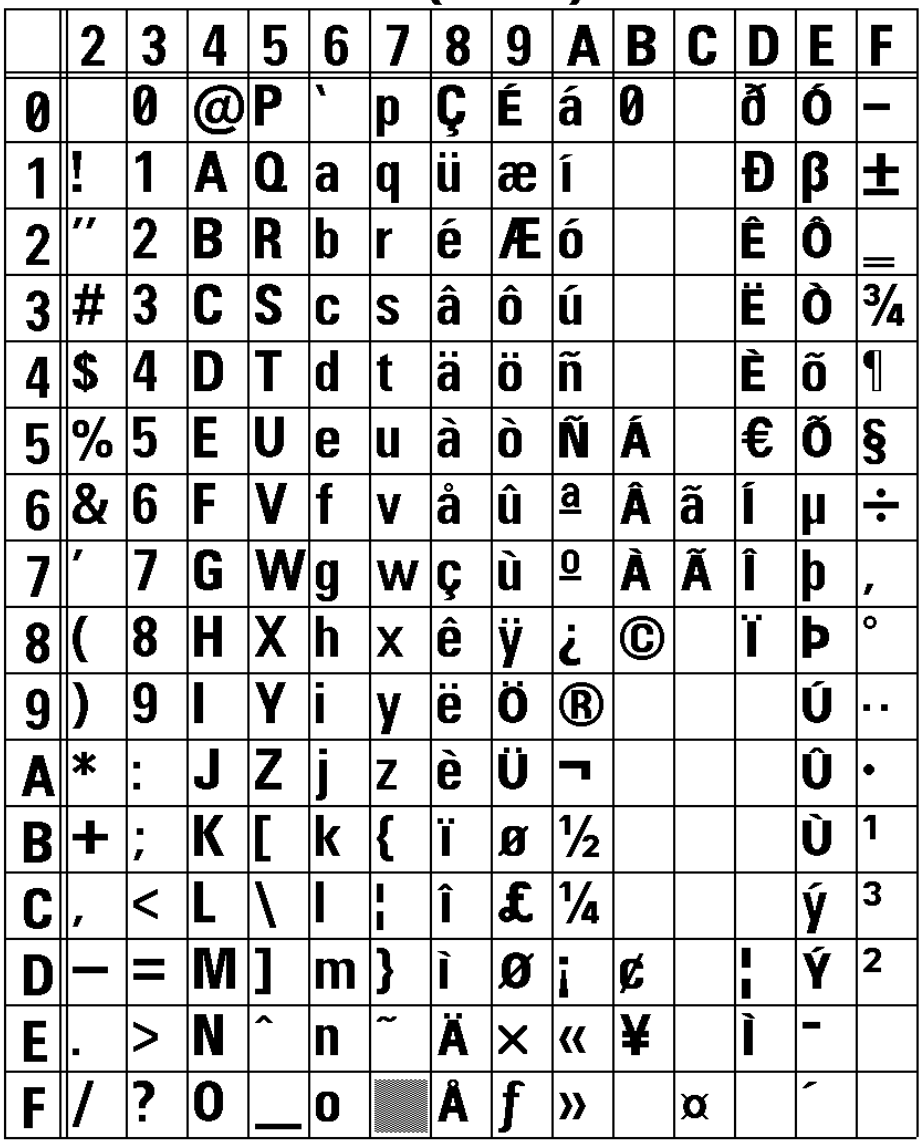
[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

XB font character set

Basic size is 48 x 48 dots (width x height)

XB FONT(L0101) 203DPI



The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 1 (vertical/horizontal) and DOS 858.

9.5 Font

Available printer	China model	Thailand model	Vietnam model		

XL Font (Basic size 48x48 dots)

ESC+XL

HEX code	ESC	XL	Parameter
	<1B>16	<58>16<4C>16	an~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Font with the basic size of: width 48 dots, height 48 dots is specified.

[Format]
<XL>an~n
● Parameter

a	[Smoothing]	=	0	:	Smoothing OFF
			1	:	Smoothing ON (Only available if expansion factor is between 3 and 12)
n	[Print data]	=	Data		

[Coding example]
<A>
<V>100<H>200<P>2<L>0304**<XL>0ABCDE**
<Q>2
<Z>

[Supplementary Explanation]
1. The XL font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.
3. When the smoothing is enabled, and the expansion <L> command is set to 1 or 2, the smoothing function will be ignored.
4. The character set varies according to setting of <CE> command.

[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

XL font character set

Basic size is 48 x 48 dots (width x height)

XL FONT(L0101) 203DPI

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

The print sample shown above is issued with a head density of 8 dots/mm, magnification factor of 1 (vertical/horizontal) and DOS 858.

9.6 Font

Available printer	China model	Thailand model	Vietnam model		

OCR-A Font

ESC+OA

HEX code	ESC	OA	Parameter
	<1B>16	<4F>16<41>16	n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies OCR-A font.

[Format]
<OA>n~n

● Parameter
n [Print data] = Data

[Coding example]
<A>
<V>100<H>100<P>2<L>0202**<OA>ABC**
<Q>2
<Z>

[Supplementary Explanation]
1. Refer to the table below for font size of each head density.

[Font size table]

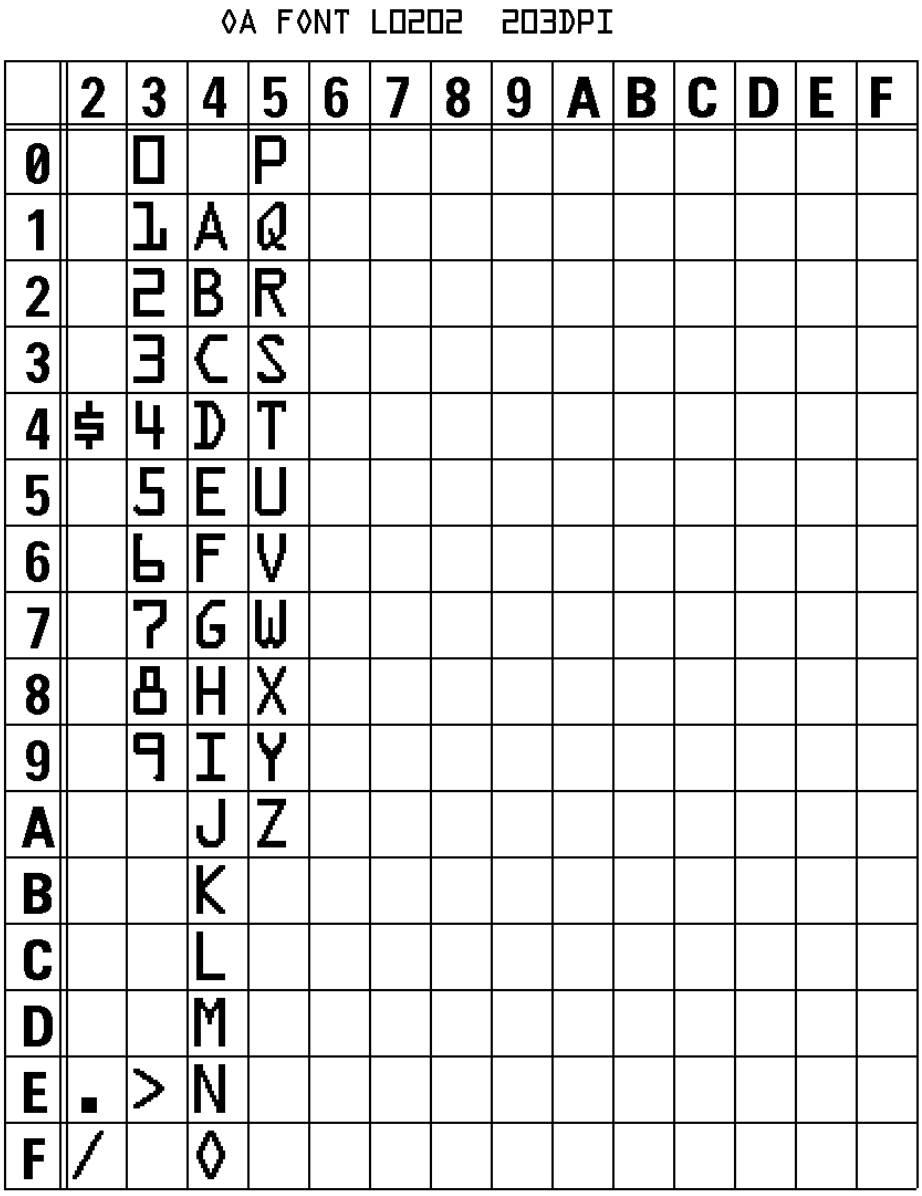
Head density	Font size (dots)
8 dots/mm (203dpi)	W15 x H22

[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<F>						
Barcode	<D><d>	<BL><d>								

OCR-A font character set

OCR-A font settings.



The print sample shown above is issued with a head density of 8 dots/mm, a font size of 15x22, and an expansion factor of 2 (vertical/horizontal).

9.7 Font

Available printer	China model	Thailand model	Vietnam model		

OCR-B Font

ESC+OB

HEX code	ESC	OB	Parameter
	<1B>16	<4F>16<42>16	n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies OCR-B font.

[Format]
<OB>n~n

- Parameter
  n [Print data] = Data

[Coding Example]
<A>
<V>100<H>100<P>2<L>0202**<OB>ABC**
<Q>2
<Z>

[Supplementary Explanation]
1. Refer to the table below for font size of each head density.

[Font Size]

Head density	Font seize(dots)
8 dots/mm (203dpi)	W20xH24

[Valid Command]

Print positon	<V>	<H>								
Modification	<P>	<L>	<%>	<F>						
Barcode	<D><d>	<BL><d>								

OCR-B Font Character Set

OCR-B font specification.

OB FONT(L0202) 203DPI

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

The print sample shown above is issued with a head density of 8 dots/mm, a font size of 20x24, and an expansion factor of 2 (vertical/horizontal).

9.8 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Kanji in Horizontal Line (GB18030)

ESC+K1

HEX code	ESC	K1	Parameter
	<1B>16	<4B>16<31>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot horizontal written Kanji character print

[Format]

<K1>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding example 1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

<A>
<V>100<H>100<P>8<L>0203
<K1>HD6D0B9FAB1EAD7BCHD6D0B9FAB1EAD7BC
<Q>1
<Z>

[Coding example 2] Binary code of JIS, horizontal expansion factor: 2, vertical expansion factor: 3

<A>
<V>100<H>200<P>2<L>0203
<K1>B!J3t!K%5%H!<
<Q>2
<Z>

[Supplementary Explanation]

1. HEX characters = Kanji Code 4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.9 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Kanji in Horizontal Line (GB18030)

ESC+K2

HEX code	ESC	K2	Parameter
	<1B>16	<4B>16<32>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot horizontal written Kanji character print

[Format]

<K2>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding Example1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

<A>
<V>100<H>100<P>8<L>0203
<K2>HD6D0B9FAB1EAD7BC
<Q>1
<Z>

[Coding Example2] Binary code of JIS, horizontal expansion factor: 2, vertical expansion factor: 3

<A>
<V>100<H>200<P>2<L>0203
<K2>B ! J3T ! K%5%H ! <
<Q>2
<Z>

[Supplementary Explanation]

1. HEX characters = Kanji Code 4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.10 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Kanji in horizontal line with 1-byte character (GB18030)	ESC+K8

HEX code	ESC	K8	Parameter
	<1B>16	<4B>16<38>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W16 x H16 dots Kanji and W8 x H16 dots half size character in horizontal line.

[Format]

<K8>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

```
<A>
<V>100<H>100<P>8<L>0203
<K8>HD6D0B9FAB1EAD7BC303132
<Q>1
<Z>
```

[Supplementary Explanation]

1. HEX characters = Kanji Code 2/4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 1/2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function validity range = Horizontal/vertical validity range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical validity range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for GB18030
4. For the half size character specification (1-byte character code), printing will be performed in W8 x H16 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W16 x H16 dots.
6. For the full size character specification (4-byte character code), printing will be performed in W16 x H16 dots.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.11 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Kanji in horizontal line with 1-byte character (GB18030)	ESC+K9

HEX code	ESC	K9	Parameter
	<1B>16	<4B>16<39>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies to print the mixture text of W24 x H24 dots Kanji and W12 x H24 dots half size character in horizontal line.

[Format]
<K9>an~n
●Parameter

a	[Kanji selection mode]	=	H	:	HEX character
			B	:	Binary code
			I	:	HEX character letters, smoothing function
			C	:	Binary code, smoothing function
			J	:	HEX character letters, highlight function
			D	:	Binary code, highlight function
			K	:	HEX character letters, smoothing and highlight function
			E	:	Binary character letters, smoothig and highlight function
n	[Data]	=	Refer to the code table (GB18030).		

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times
<A>
<V>100<H>100<P>8<L>0203
<K9>HD6D0B9FAB1EAD7BC303132
<Q>1
<Z>

[Supplementary Explanation]

1. HEX characters	=	Kanji Code 2/4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code	=	Kanji Code 1/2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function valid range	=	Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function valid range	=	Horizontal/vertical valid range : factor 1 to 5

[Notes]
1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code, Unicode or GB18030
4. For the half size character specification (1-byte character code), printing will be performed in W12 x H24 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W24 x H24 dots.
6. For the full size character specification (4-byte character code), printing will be performed in W16 x H16 dots.
7. Priority of emphasis function varies by [Kanji specify mode] with command <FB>. Specifying <FB> is valid if [Kanji specify mode] is H.B.I.C. Specifying <FB> is invalid if [Kanji specify mode] is J.D.K.E then emphasis function is prioritized in [Kanji specify mode].

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.12 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Kanji in vertical line (GB18030)

ESC+k1

HEX code	ESC	k1	Parameter
	<1B>16	<6B>16<31>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot vertical written Kanji character print

[Format]

<k1>an~n

●Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding example 1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

<A>
<V>100<H>100<P>8<L>0203
<k1>HD6D0B9FAB1EAD7BC
<Q>1
<Z>

[Coding Example 2] Binary code of JIS, horizontal expansion factor: 2, vertical expansion factor: 3

<A>
<V>100<H>200<P>2<L>0203
<k1>B ! J3T ! K%5%H ! <
<Q>2
<Z>

[Supplementary Explanation]

1. HEX characters = Kanji Code 4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.13 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Kanji in vertical line (GB18030)

ESC+k2

HEX code	ESC	k2	Parameter
	<1B>16	<6B>16<32>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot vertical written Kanji character print

[Format]

<k2>an~n

●Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding Example1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

<A>
<V>100<H>100<P>8<L>0203
<k2>HD6D0B9FAB1EAD7BC
<Q>1
<Z>

[Coding Example2] Binary code of JIS, horizontal expansion factor: 2, vertical expansion factor: 3

<A>
<V>100<H>200<P>2<L>0203
<k2>B ! J3T ! K%5%H ! <
<Q>2
<Z>

[Supplementary Explanation]

1. HEX characters = Kanji Code 4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.14 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Kanji in vertical line with 1-byte character (GB18030)	ESC+k8

HEX code	ESC	k8	Parameter
	<1B>16	<6B>16<38>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W16 x H16 dots Kanji and W8 x H16 dots half size character in vertical line.

[Format]

<k8>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

```
<A>
<V>100<H>100<P>8<L>0203
<k8>HD6D0B9FAB1EAD7BC303132
<Q>1
<Z>
```

[Supplementary Explanation]

1. HEX characters = Kanji Code 2/4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function validity range = Horizontal/vertical validity range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical validity range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or GB18030
4. For the half size character specification (1-byte character code), printing will be performed in W8 x H16 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W16 x H16 dots.
6. For the full size character specification (4-byte character code), printing will be performed in W16 x H16 dots.

[Attention]

1. When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.
   e.g.) When the word "ﾊﾞｰ" is specified, it will be written separately such as "ﾊ", "゛", "ｰ".

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.15 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Kanji in vertical line with 1-byte character (GB18030)	ESC+k9

HEX code	ESC	k9	Parameter
	<1B>16	<6B>16<39>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W24 x H24 dots Kanji and W12 x H24 dots half size character in vertical line.

[Format]

<k9>an~n

●Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table (GB18030).

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

```
<A>
<V>100<H>100<P>8<L>0203
<k9>HD6D0B9FAB1EAD7BC303132
<Q>1
<Z>
```

[Supplementary Explanation]

1. HEX characters = Kanji Code 2/4/8 bytes ASCII / 1 Kanji/Chinese character
2. Binary code = Kanji Code 1/2/4 bytes / 1 Kanji/Chinese character
3. Smoothing function valid range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function valid range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.
3. This command is valid for Shift JIS Kanji code or GB18030
4. For the half size character specification (1-byte character code), printing will be performed in W12 x H24 dots.
5. For the full size character specification (2-byte character code), printing will be performed in W24 x H24 dots.
6. For the full size character specification (4-byte character code), printing will be performed in W24 x H24 dots.

[Attention]

1. When half-sized character with voiced/P-sound consonant mark is specified, each part of character appears as a single character.
   e.g.) When the word "ﾊﾟｰ" is specified, it will be written separately such as "ﾊ", "ﾟ", "ｰ".

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.16 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Chinese Font in Horizontal Line

ESC+C1

HEX code	ESC	C1	Parameter
	<1B>16	<43>16<31>16	an~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot horizontal written Chinese font character print

[Format]

<C1>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding example 1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜C1＞HD6D0B9FAB1EAD7BCHD6D0B9FAB1EAD7BC
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.17 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Chinese font in Horizontal Line

ESC+C2

HEX code	ESC	C2	Parameter
	<1B>16	<43>16<32>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot horizontal written Chinese font character print

[Format]

<C2>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding example 1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜C2＞HD6D0B9FAB1EAD7BC
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.18 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Chinese font in horizontal line with 1-byte character	ESC+C8

HEX code	ESC	C8	Parameter
	<1B>16	<43>16<38>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W16 x H16 dots Chinese font and W8 x H16 dots half size character in horizontal line.

[Format]

<C8>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜C8＞HD6D0B9FAB1EAD7BC303132
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 2/4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 1/2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.19 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Chinese font in horizontal line with 1-byte character	ESC+C9

HEX code	ESC	C9	Parameter
	<1B>16	<43>16<39>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W24 x H24 dots Chinese font and W12 x H24 dots half size character in horizontal line.

[Format]

<C9>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜C9＞HD6D0B9FAB1EAD7BC303132
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 2/4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 1/2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.20 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Chinese Font in Vertical Line

ESC+c1

HEX code	ESC	C1	Parameter
	<1B>16	<63>16<31>16	an~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 16x16 (width x height) dot vertical written Chinese font character print

[Format]

<c1>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding example 1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜c1＞HD6D0B9FAB1EAD7BC
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.21 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Chinese font in Vertical Line

ESC+c2

HEX code	ESC	c2	Parameter
	<1B>16	<63>16<32>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies 24x24 (width x height) dot vertical written Chinese font character print

[Format]

<c2>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding example 1] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜c2＞HD6D0B9FAB1EAD7BC
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.22 Font

Available printer	China model	Thailand model	Vietnam model		

16x16 dots Chinese font in vertical line with 1-byte character	ESC+c8

HEX code	ESC	C8	Parameter
	<1B>16	<63>16<38>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W16 x H16 dots Chinese font and W8 x H16 dots half size character in vertical line.

[Format]

<c8>an~n

● Parameter

a [Kanji selection mode] = H : HEX character
B : Binary code
I : HEX character letters, smoothing function
C : Binary code, smoothing function
J : HEX character letters, highlight function
D : Binary code, highlight function
K : HEX character letters, smoothing and highlight function
E : Binary character letters, smoothig and highlight function

n [Data] = Refer to the code table of GB18030.

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜c8＞HD6D0B9FAB1EAD7BC303132
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 2/4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 1/2/4 bytes / 1 character
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.23 Font

Available printer	China model	Thailand model	Vietnam model		

24x24 dots Chinese font in vertical line with 1-byte character

ESC+c9

HEX code	ESC	c9	Parameter
	<1B>16	<63>16<39>16	an~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies to print the mixture text of W24 x H24 dots Chinese font and W12 x H24 dots half size character in vertical line.

[Format]

<c9>an~n

● Parameter

a	[Kanji selection mode]	=	H	:	HEX character
			B	:	Binary code
			I	:	HEX character letters, smoothing function
			C	:	Binary code, smoothing function
			J	:	HEX character letters, highlight function
			D	:	Binary code, highlight function
			K	:	HEX character letters, smoothing and highlight function
			E	:	Binary character letters, smoothig and highlight function
n	[Data]	=	Refer to the code table of GB18030.		

[Coding Example] HEX Character Specification, horizontal direction ratio：2 times, vertical direction ratio：3 times

＜A＞
＜V＞100＜H＞100＜P＞8＜L＞0203
＜c9＞HD6D0B9FAB1EAD7BC303132
＜Q＞1
＜Z＞

[Supplementary Explanation]

1. HEX characters = Chinese font Code 2/4/8 bytes ASCII / 1 character
2. Binary code = Chinese font Code 1/2/4 bytes / 1c haracter
3. Smoothing function validity range = Horizontal/vertical valid range : factor 3 to 12
4. Highlighting function validity range = Horizontal/vertical valid range : factor 1 to 5

[Notes]

1. With the highlighting function, the character width enlarges proportional with the expansion factor.
2. Using the highlighting function, in some cases, depending on the type of font, characters become squeezed.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>							

9.24 Font

Available printer	China model	Thailand model	Vietnam model		

XV1 Font (Basic size 9x9 dots)

ESC+XV1

HEX code	ESC	XV1	Parameter
	<1B>16	<58>16<56>16<31>16	n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specify the Vietnamese font with basic size of width 9 × height 9 dots.

[Format]

<XV1>n~n

●Parameter

n [Print data] = Character codes to be treated as Unicode (UTF-8) binary code

[Coding Example 1] Print data:ABCD

<A>
<V>100<H>200<P>2<L>0304
<XV1>[41]16[42]16[43]16[44]16
<Q>2
<Z>

[Coding Example 2] Print data:Ạạ Ḃḃ

<A>
<V>100<H>200<P>2<L>0304
<XV1>[E1]16[B8]16[80]16[E1]16[B8]16[81]16[E1]16[B8]16[82]16[E1]16[B8]16[83]16
<Q>2
<Z>

[Supplementary Explanation]

1. The XV1 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

9.25 Font

Available printer	China model	Thailand model	Vietnam model		

XV2 Font (Basic size 16x16 dots)

ESC+XV2

HEX code	ESC	XV2	Parameter
	<1B>16	<58>16<56>16<32>16	n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specify the Vietnamese font with basic size of width 16 × height 16 dots.

[Format]

<XV2>n~n

●Parameter

n [Print data] = Character codes to be treated as Unicode (UTF-8) binary code

[Coding Example 1] Print data:ABCD

<A>
<V>100<H>200<P>2<L>0304
<XV2>[41]16[42]16[43]16[44]16
<Q>2
<Z>

[Coding Example 2] Print data:Ạạ Ḅḅ

<A>
<V>100<H>200<P>2<L>0304
<XV2>[E1]16[B8]16[80]16[E1]16[B8]16[81]16[E1]16[B8]16[82]16[E1]16[B8]16[83]16
<Q>2
<Z>

[Supplementary Explanation]

1. The XV2 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

9.26 Font

Available printer	China model	Thailand model	Vietnam model		

XV3 Font (Basic size 24x24 dots)

ESC+XV3

HEX code	ESC	XV3	Parameter
	<1B>16	<58>16<56>16<33>16	n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specify the Vietnamese font with basic size of width 24 × height 24 dots.

[Format]

<XV3>n~n

●Parameter

n [Print data] = Character codes to be treated as Unicode (UTF-8) binary code

[Coding Example 1] Print data:ABCD

<A>
<V>100<H>200<P>2<L>0304
<XV3>[41]16[42]16[43]16[44]16
<Q>2
<Z>

[Coding Example 2] Print data:ẠạḂḅ

<A>
<V>100<H>200<P>2<L>0304
<XV3>[E1]16[B8]16[80]16[E1]16[B8]16[81]16[E1]16[B8]16[82]16[E1]16[B8]16[83]16
<Q>2
<Z>

[Supplementary Explanation]

1. The XV3 font allows the setting of a fixed pitch or the setting of a proportional pitch.
2. Font pitch (fixed/proportional) can be selected via command or font setting mode on priner LCD settings.

[Valid Command]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>				
Barcode	<D><d>	<BL><d>								

XV1, XV2, XV3 font character set

Character code table (H'0020～H'CCA3)

	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
20		!	“	#	$	%	&	‘	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	□
:																
C2A0		¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	-	®	¯
C2B0	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
C380	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
C390		Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý		ß
C3A0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
C3B0		ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý		ÿ
C480			Ă	ă												
C490	Đ	đ														
C4A0									Ĩ	ĩ						
:																
C590			Œ	œ												
C5A0									Ũ	ũ						
C5B0									Ÿ							
:																
C690			ƒ													
C6A0	Ơ	ơ														Ư
C6B0	ư															
:																
CB80							ˆ									
CB90													˜			
:																
CC80	̀	́		̃						̓						
:																
CCA0				.												

※ Treats all character codes as Unicode (UTF-8).
※ Line feed in the data is combined with 0x0d and 0x0a.
※ Combined characters are not supported. Treats each as an independent character.

Character code table (H'E1B880～H'E284AF)

	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
E1B880	Ḁ	ḁ	Ḃ	ḃ	Ḅ	ḅ	Ḇ	ḇ	Ḉ	ḉ	Ḋ	ḋ	Ḍ	Ḍ	Ḍ	ḍ
E1B890	Ḏ	ḏ	Ḑ	ḑ	Ḓ	ḓ	Ḕ	ḕ	Ḗ	ḗ	Ḙ	ḙ	Ḛ	ḛ	Ḟ	ḟ
E1B8A0	Ḡ	ḡ	Ḣ	ḣ	Ḥ	ḥ	Ḧ	ḧ	Ḩ	ḩ	Ḫ	ḫ	Ḭ	ḭ	Ḯ	ḯ
E1B8B0	Ḱ	ḱ	Ḳ	ḳ	Ḵ	ḵ	Ḷ	ḷ	Ḹ	Ḹ	Ḻ	ḻ	Ḽ	ḽ	Ḿ	ḿ
E1B980	Ṁ	ṁ	Ṃ	ṃ	Ṅ	ṅ	Ṇ	ṇ	Ṉ	ṉ	Ṋ	ṋ	Ṍ	ṍ	Ṏ	ṏ
E1B990	Ṑ	ṑ	Ṓ	ṓ	Ṕ	ṕ	Ṗ	ṗ	Ṙ	ṙ	Ṛ	ṛ	Ṝ	ṝ	Ṟ	ṟ
E1B9A0	Ṡ	ṡ	Ṣ	ṣ	Ṥ	ṥ	Ṧ	ṧ	Ṩ	ṩ	Ṫ	ṫ	Ṭ	ṭ	Ṯ	ṯ
E1B9B0	Ṱ	ṱ	Ṳ	ṳ	Ṵ	ṵ	Ṷ	ṷ	Ṹ	ṹ	Ṻ	ṻ	Ṽ	ṽ	Ṿ	ṿ
E1BA80	Ẁ	ẁ	Ẃ	ẃ	Ẅ	ẅ	Ẇ	ẇ	Ẉ	ẉ	Ẋ	ẋ	Ẍ	ẍ	Ẏ	ẏ
E1BA90	Ẑ	ẑ	Ẓ	ẓ	Ẕ	ẕ	ẖ	ẗ	ẘ	ẙ	ẚ	ẛ				
E1BAA0	Ạ	ạ	Ả	ả	Ấ	ấ	Ầ	ầ	Ẩ	ẩ	Ẫ	ẫ	Ậ	ậ	Ắ	ắ
E1BAB0	Ằ	ằ	Ẳ	ẳ	Ẵ	ẵ	Ặ	ặ	Ẹ	ẹ	Ẻ	ẻ	Ẽ	ẽ	Ế	ế
E1BB80	Ề	ề	Ể	ể	Ễ	ễ	Ệ	ệ	Ỉ	ỉ	Ị	ị	Ọ	ọ	Ỏ	ỏ
E1BB90	Ố	ố	Ồ	ồ	Ổ	ổ	Ỗ	ỗ	Ộ	ộ	Ớ	ớ	Ờ	ờ	Ở	ở
E1BBA0	Ỡ	ỡ	Ợ	ợ	Ụ	ụ	Ủ	ủ	Ứ	ứ	Ừ	ừ	Ử	ử	Ữ	ữ
E1BBB0	Ự	ự	Ỳ	ỳ	Ỵ	ỵ	Ỷ	ỷ	Ỹ	ỹ						
:																
E28090				–	—				‘	’	‚		“	”	„	
E280A0	†	‡	•				…									
E280B0	‰									‹	›					
:																
E282A0												₫	€			
:																
E284A0			™													

※ Treats all character codes as Unicode (UTF-8).
※ Line feed in the data is combined with 0x0d and 0x0a.
※ Combined characters are not supported. Treats each as an independent character.

10 Barcode Command

In barcode specification, print of various barcodes, change of bar width ratio, and print of guard bar or human-readable information can be performed by the specification (B, D, BD) after ESC.

The contents may vary depending on the specification. This and next page should be read closely and followed.

Refer to the table below for the specification of B, D, and BD.

[Specification of Bar width ratio]

Barcode specification parameter	Barcode specification	<B>	<D>	<BD>
0	CODABAR(NW-7)	1:3	1:2	2:5
1	CODE39	1:3	1:2	2:5
2	ITF	1:3	1:2	2:5
5	Industrial 2 of 5	1:3	1:2	2:5
6	Matrix 2 of 5	1:3	1:2	2:5

(1) Bar width ratio

Barcode is composed of Narrow Bar, Wide Bar, Narrow Space and Wide Space. Bar width ratio is the proportion of Narrow Bar and Wide Bar.

Bar width ratio (Ratio 1 : 3) <B>
This barcode is composed of Narrow Bar [1] and Wide Bar [3].
Bar width ratio (Ratio 1 : 2) <D>
This barcode is composed of Narrow Bar [1] and Wide Bar [2].
Bar width ratio (Ratio 2 : 5) <BD>
This barcode is composed of Narrow Bar [2] and Wide Bar [5].

If specifying bar width ratio for your own convenience, register the ratio with Bar Width Ratio <BT> and print labels with Print of Specified Bar Width Ratio <BW>.

(2) Width of narrow bar and height of barcode

Narrow bar indicates the narrow bar width, and bar height indicates the height of barcode.
For instance, printing narrow bar for 1 dot in head density of 8 dots/mm (203dpi), the narrow bar width will be 0.125mm and barcode scanner may have a read problem. To avoid this problem, set the narrow bar to 2 dots so that the narrow bar width will be 0.25mm and this will improve the scanner reading condition.
There is a necessity to set the narrow bar width based on the printer head density or performance of barcode scanner.
In bar width ratio, [Narrow bar width] specification sets the width of bar.

e.g.) When bar width ratio = 1 : 3 and narrow bar width is 3 dots, bar width ratio becomes 3 : 9.
Bar height is to specify the height of barcode, and proper height based on the scanner type can be set.

(3) Intercharacter gap

Intercharacter gap is the space between two adjacent barcode characters in a discrete barcode.
To specify and enable intercharacter gap, insert Character Pitch <P> right before barcode specification such as <B>,<D> and <BD> or Print of Barcode with Registered Ratio <BW>. If not, initial value (2 dots) will be set.

Intercharacter gap is designable for the following barcodes.
1) CODABAR(NW-7)
2) CODE 39
3) Industrial 2 of 5
4) Matrix 2 of 5

Intercharacter gap is the multiplier of values specified with Character Pitch <P> and narrow bar width.
e.g.) When Character Pitch <P> is 3 and narrow bar width is 2 dots:
Intercharacter gap = 3 x 2 = 6 (dots)

(4) Designation of human readable information (HRI) and guard bar

For UPC-A and JAN/EAN 8 and13 digits barcode, availability of human-readable information (hereinafter HRI) and guard bar can be specified.

Barcode parameter	Barcode	<B>	<D>	<BD>
3	JAN/EAN 13	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available
4	JAN/EAN 8	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available
H	UPC-A	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available

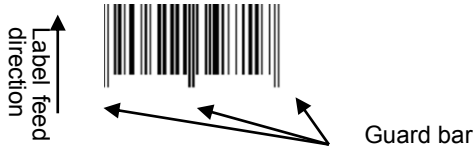
Barcode parameter	Barcode	<BM>	<BL>
H	JAN/EAN13	HRI : Available Guard bar: Available	HRI : Available Guard bar: Nil

(1) Specification of <B> (No HRI, No guard bar)

If specifying <B>, following barcode will be printed.

(2) Specification of <D> (No HRI, Guard bar available)

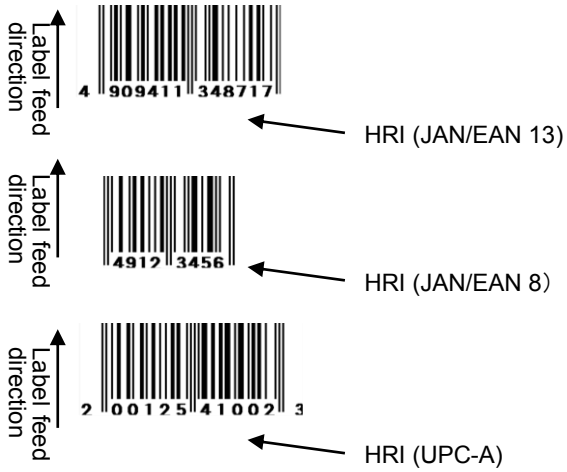
If specifying <D>, following barcode will be printed.



[Note] HRI is printable specifying <Character Type> data subsequently to <D>.
For more information, refer to Barcode Specification (Selection of HRI) <D>~<d>.

(3) Specification of <BD> (HRI and guard bar available)

If specifying <BD>, following barcode will be printed.



[Barcode Specification Only]

Barcode specification parameter	Barcode specification	<B>
C	CODE 93	Barcode only
E	UPC-E	Barcode only
G	CODE 128	Barcode only
I	UCC/EAN 128 for standard carton ID	Barcode only
Z	Customer code	Barcode only

[Important]

1. In this case, barcode will not have specification such as Bar Width Ratio and HRI.
2. HRI attached to barcode will not be printed when the barcode has an error.

(5) Composition of check digit

Refer to the table below for check digit in each barcode.

[Composition of C/D]

Barcode specification parameter	Barcode specification	Input digit No.	Print digit number and contents
3	JAN/EAN 13	12-digit	13-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
		13-digit	13-digit (Input data of barcode) C/D is not checked.
4	JAN/EAN 8	7-digit	8-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
		8-digit	8-digit (Input data of barcode) C/D is not checked.
C	CODE 93	Max. 99- digit	C/D is calculated by modulus47.
E	UPC-E	6-digit only	C/D is calculated by modulus10.
G	CODE 128	-	C/D is calculated by modulus103.
H	UPC-A	11-digit only	12-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
I	UCC/EAN128 for standard carton ID	17-digit only	C/D is calculated by modulus103.

[Note] C/D stands for “Check Digit”.

(6) Barcode Rotation Print

Print of barcode rotation is available. Note that when specifying Serial 1 and Serial 2 for barcode rotation, it may cause blurring due to barcode enlargement ratio.

Avoid printing of 1-dot narrow bar since 1 dot becomes 0.125mm when headdensity is 8dot/mm (203dpi).

Parallel 1 : Forward feed print
Parallel 2 : Backfeed print at 180-degree rotation

Serial 1 : Forward feed print at 90-degree rotation
Serial 2 : Forward feed print at 270-degree rotation

[Note] Forward feed:
Prints horizontally to label feed direction

1) To print with Parallel1 and Parallel2, specify enlargement ratio of bar width so that narrow bar gets at least 2 dots. (“L” indicates the enlargement ratio to the bar width ratio.)

	Head density
	8 dots/mm
Bar width ratio 1:2	2L or more
Bar width ratio 1:3	2L or more
Bar width ratio 2:5	1L or more
UPC-A/EAN/JAN	2L or more

2) If printing in serial 1 or serial 2 mode, specify the bar width expansion factor so that when using a 8 dots/mm or 12 dots/mm head the width of the narrow bar is at least 3 dots.

	Head density
	8 dots/mm(203dpi)
Bar ratio 1:2	3L or more
Bar ratio 1:3	3L or more
Bar ratio 2:5	2L or more
UPC-A/JAN/EAN	3L or more

3) If printing in serial 1 or serial 2, reduce the print speed

10.1 Barcode

Available printer	China model	Thailand model	Vietnam model		

Barcode (Ratio 1:3) ESC+B

HEX code	ESC	B	Parameter
	<1B>16	<42>16	Abbcccn ~ n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

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

[Format]

<B>abbcccn~n

● Parameter

a	[Barcode type]	=	Refer to table below		
b	[Narrow bar width]	=	Valid range	:	01 to 12 dots
c	[Barcode height]	=	Valid range	:	001 to 999 dots
n	[Print data]	=	Data		

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

a	Barcode symbol	Description	Ratio
0	CODABAR(NW-7)	Set print data including Start/Stop character. Start/Stop characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. Note that scan result of the characters [E,N,T,a,b,c,d,e,n,t] is [D, B, A, A, B, C, D, D, B, A]. e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch becomes enabled. For print data, refer to the CODABAR (NW-7) code table.	1:3
1	CODE39	Set print data including Start/Stop character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch becomes enabled. For print data, refer to the CODE39 code table.	1:3
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, add “0” to the head of print data. For print data, refer to the ITF code table.	1:3
3	JAN/EAN13	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN13 code	Fixed
4	JAN/EAN8	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN8 code	Fixed
5	Industrial 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Industrial 2of5 code	1:3
6	Matrix 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Matrix 2of5 code	1:3
A	MSI	Specify 13-digit number for print data. For print data specifications, refer to table of MSI code.	Fixed
C	CODE93	Refer to CODE93 <BC>.	Fixed
E	UPC-E	Specify 6-digit number for print data. For print data specifications, refer to table of UPC-E code.	Fixed
F	UPC add-on code Bookland	Refer to UPC add-on code/Bookland <BF>.	Fixed
G	CODE128	Refer to CODE128 <BG>.	Fixed
H	UPC-A	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of UPC-A code.	Fixed
I	GS1-128(UCC/EAN128)	Refer to GS1-128(UCC/EAN128)<BI>.	Fixed
Z	Customer barcode	Refer to Customer barcode <BZ>.	Fixed

[Coding Example 1] Barcode symbology: CODE39 Narrow bar width: 03 Height of barcode: 120
Print data: *1234AB*

```
<A>
<V>100<H>100<B>103120*1234AB*
<Q>2
<Z>
```

[Coding Example 2] Barcode symbology: JAN-8 Narrow bar width: 02 Height of barcode: 080
Print data: 4912345

```
<A>
<V>100<H>100<B>4020804912345
<Q>2
<Z>
```

[Supplementary Explanation]

1. The inter-character pitch of the barcode is valid at CODABAR (NW-7), CODE39, Industrial 2of5 and Matrix 2of5.
   The barcode inter-character pitch is set by specifying the character pitch <P> immediately before.
   If not set, the inter-character pitch will be of the same size as a narrow space and will become multiples of a narrow bar.

Command	Ratio	Narrow space width	<P> specification	Character pitch	
				Narrow bar width is [1]	Narrow bar width is [2]
<B>	1:3	1	None	1	2
			<P>0	1	2
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. For print data of each barcode type, refer to the code tables of barcode.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will be printed even if the data exceed the printable area.
3. Increasing narrow bar width may exceed the print area.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner and headdensity beforehand.
   203dpi: 2dots or more
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. Matrix 2of5 will be expressed as Coop2of5/NEC2of5.
8. If Start/Stop character is not included in print data at the time of CODABAR (NW-7) or CODE39 specified, barcode will be printed; however, scanner can not read it.
9. If sending the print data including check digit at the time of JAN/EAN-13 or JAN/EAN-8 specified, set the correct calculated value. Barcode will be printed even when the data includes improper check digit; however, scanner can not read it.

10.2 Barcode

Available printer	China model	Thailand model	Vietnam model		

Barcode (Ratio 1:2)

ESC+D

HEX code	ESC	D	Parameter
	<1B>16	<44>16	abbcccn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

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

[Format]

<D>abbcccn~n

●Parameter

a	[Barcode type]	=	Refer to table below		
b	[Narrow bar width]	=	Valid range	:	01 to 12 dots
c	[Barcode height]	=	Valid range	:	001 to 999 dots
n	[Print data]	=	Data		

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

A	Barcode symbol	Description	Ratio
0	CODABAR(NW-7)	Set print data including Start/Stop character. Start/Stop characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. Note that scan result of the characters [E,N,T,a,b,c,d,e,n,t] is [D, B, A, A, B, C, D, D, B, A]. e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch becomes enabled. For print data, refer to the CODABAR (NW-7) code table.	1:2
1	CODE39	Set print data including Start/Stop character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch becomes enabled. For print data, refer to the CODE39 code table.	1:2
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, add “0” to the head of print data. For print data, refer to the ITF code table.	1:2
3	JAN/EAN13	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN13 code	Fixed
4	JAN/EAN8	This barcode has no guard bars and no human-readable characters For print data specifications, refer to table of JAN/EAN8 code	Fixed
5	Industrial 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Industrial 2of5 code	1:2
6	Matrix 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Matrix 2of5 code	1:2
H	UPC-A	This barcode has no human-readable characters but guard bar. For print data specifications, refer to table of UPC-A code	Fixed

[Coding Example 1]Barcode symbology: CODABAR (NW-7), Narrow bar width: 03, Height of barcode: 120,
Print data: A1234A

<A>
<V>100<H>100**<D>003120A1234A**
<Q>2
<Z>

[Coding Example 2]Barcode symbology: ITF, Narrow bar width: 02, Height of barcode: 080
Print data: 98002345678163

<A>
<V>100<H>100**<D>20208098002345678163**
<Q>2
<Z>

[Coding Example 3]Barcode symbology: UPC-A, Narrow bar width: 03, Height of barcode: 120
Print data: 20123948573

<A>
<V>240<H>100**<D>H0312020123948573**
<Q>2
<Z>

[Supplementary Explanation]

1. The inter-character pitch of the barcode is valid at CODABAR (NW-7), CODE39, Industrial 2of5 and Matrix 2of5.
   The barcode inter-character pitch is set by specifying the character pitch <P> immediately before.
   If not set, the inter-character pitch will be of the same size as a space command and multiple number of narrow bar width.

e.g.)

Command	Ratio	Narrow width	<P>	Inter-character gap	
				Narrow bar width: 1	Narrow bar width: 1
<D>	1:2	1	None	1	2
			<P>0	1	2
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. For print data of each barcode type, refer to the code tables of barcode.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will not be printed when the data exceeds the printable area.
3. Increasing narrow bar width may exceed the print area.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner and headdensity beforehand.
   203dpi: 2dots or more
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. Matrix 2of5 will be expressed as Coop2of5/NEC2of5.
8. If Start/Stop character is not included in print data at the time of CODABAR (NW-7) or CODE39 specified, barcode will be printed; however, scanner can not read it.
9. If sending the print data including check digit at the time of JAN/EAN-13 or JAN/EAN-8 specified, set the correct calculated value. Barcode will be printed even when the data includes improper check digit; however, scanner can not read it.

10.3 Barcode

Available printer	China model	Thailand model	Vietnam model		

Barcode (with HRI)

ESC+D ~ ESC+d

HEX code	ESC	D ~ d	Parameter
	<1B>16	<44>16 ~ Character type	abbcccn~n ~ <d>n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies character type of human readable interpretation (HRI) for barcode.

[Format]

<D>abbcccn~n ~ <d>n~n

●Parameter

a	[Barcode symbology]	=	3: JAN/EAN13
		=	4: JAN/EAN8
			H: UPC-A
b	[Narrow bar width]	=	Valid range: 01 to 12 dots
c	[Barcode height]	=	Valid range : 001 to 999 dots
n	[Print data]	=	Barcode data
d	[Character type]	=	XU
			XS
			XM
			XB
			XL
			OA
			OB
			XV1 *
			XV2 *
			XV3 *
n	[Print data]	=	HRI data

* Only available for Vietnam model.

[Coding Example] Barcode type: JAN/EAN13, Narrow bar width: 03, Barcode height: 120,
Barcode data: 4902471000793, Character type: XU
HRI data: 4902471000793

<A>
<V>100<H>200**<D>3031204902471000793**
<XU>4902471000793
<Q>2
<Z>

[Supplementary Explanation]

1. Adds HRI characters to specified font.
2. When the data other than specified value is set, printing will not be performed. When barcode enlargement ratio is small and character type is large, HRI text may be overlapped with each other.
3. Printer will lay out HRI properly.
4. HRI for JAN/EAN8, JAN/EAN13, UPC-A will be printed properly in the conditions below.
   Appropriate Narrow bar width is [02], [03]
5. HRI will not be printed when the barcode with HRI has an error.
6. HRI will not be printed when specifying <P> and <L> (<P>02<d>n~n, <L><d>n~n).

10.4 Barcode

Available printer	China model	Thailand model	Vietnam model		

Barcode (Ratio 2:5)

ESC+BD

HEX code	ESC	BD	Parameter
	<1B>16	<42>16<44>16	abbcccn~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

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

[Format]

<BD>abbcccn~n

●Parameter

a [Barcode symbology] = Refer to the table below

b [Narrow bar width] = Valid Range : 01 to 12 dots

c [Barcode height] = Valid range : 001 to 999 dots

n [Print data] = data

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology)

A	Barcode symbology	Descriptions	Ratio
0	CODABAR(NW-7)	Set print data including Start/Stop character. Start/Stop characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. Note that scan result of the characters [E,N,T,a,b,c,d,e,n,t] is [D, B, A, A, B, C, D, D, B, A]. e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch becomes enabled. For print data, refer to the CODABAR (NW-7) code table.	2:5
1	CODE39	Set print data including Start/Stop character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch becomes enabled. For print data, refer to the CODE39 code table.	2:5
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, add “0” to the head of print data. For print data, refer to the ITF code table.	2:5
3	JAN/EAN13	This barcode has guard bars and human-readable characters For print data specifications, refer to table of JAN/EAN13 code	Fixed
4	JAN/EAN8	This barcode has guard bars and human-readable characters For print data specifications, refer to table of JAN/EAN8 code	Fixed
5	Industrial 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Industrial 2of5 code	2:5
6	Matrix 2of5	Barcode character pitch is enabled. For print data specifications, refer to table of Matrix 2of5 code	2:5
H	UPC-A	This barcode has human-readable characters but guard bar. For print data specifications, refer to table of UPC-A code	Fixed

[Coding Example 1] Barcode symbology: CODABAR (NW-7), Narrow bar width: 03, Height of barcode: 120,
Print data: A1234A

```
<A>
<V>100<H>100<BD>003120A1234A
<Q>2
<Z>
```

[Coding Example 2] Barcode symbology: ITF,Narrow bar width: 03, Height of barcode: 120,
Print data: 98002345678163

```
<A>
<V>100<H>100<BD>20212098002345678163
<Q>2
<Z>
```

[Coding Example 3] Barcode symbology: UPC-A, Narrow bar width: 03, Height of barcode: 120
Print data: 20123948573

```
<A>
<V>240<H>100<BD>H0312020123948573
<Q>2
<Z>
```

[Supplementary Explanation]

1. The inter-character pitch of the barcode is valid at CODABAR (NW-7), CODE39, Industrial 2of5 and Matrix 2of5.
   The barcode inter-character pitch is set by specifying the character pitch <P> immediately before.
   If not set, the inter-character pitch will be of the same size as a space command.

Command	Ratil	Narrow space width	<P>	Inter-character gap	
				Narrow bar width: 1	Narrow bar width: 2
<BD>	2:5	2	Nil	2	4
			<P>0	2	4
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. For print data of each barcode type, refer to the code tables of barcode.
3. The barcode translation of following codes will be restricted to conditions below: JAN/EAN8, JAN/EAN13, UPC-A
   In case of 8 dots/mm (203dpi) : Narrow bar width must be [02], [03]
   In case of 12 dots/mm (305dpi) : Narrow bar width must be [03], [04]
   HRI will not be printed if the value other than the listed avobe is specified.

[Notes]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode will not be printed when the data exceeds the printable area.
3. Increasing narrow bar width may exceed the print area.
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner and head density beforehand.
6. Adjust Print Speed <CS> or Print Darkness <#E> in case of scanner reading problem.
7. Matrix 2of5 will be expressed as Coop2of5/NEC2of5.
8. If Start/Stop character is not included in print data at the time of CODABAR (NW-7) or CODE39 specified, barcode will be printed; however, scanner can not read it.
9. If sending the print data including check digit at the time of JAN/EAN-13 or JAN/EAN-8 specified, set the correct calculated value. Barcode will be printed even when the data includes improper check digit; however, scanner can not read it.

10.5 Barcode

Available printer	China model	Thailand model	Vietnam model		

Barcode Ratio Registration

ESC+BT

HEX code	ESC	BT	Parameter
	<1B>16	<42>16<54>16	abbccddee
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies the ratio of the narrow bar in regard to the wide bar

[Format]

<BT>abbccddee

● Parameter

a	[Barcode type]	=	0	:	CODABAR (NW-7)
			1	:	CODE39
			2	:	ITF
			5	:	Industrial 2of5
			6	:	Matrix 2of5
b	[Narrow space]	=	Valid range	:	01 to 99 dots
c	[Wide space]	=	Valid range	:	01 to 99 dots
d	[Narrow bar]	=	Valid range	:	01 to 99 dots
e	[Wide bar]	=	Valid range	:	01 to 99 dots

[Coding Example] Barcode type: CODE39, Narrow space: 03, Wide space: 05,
Narrow bar: 03, Wide bar: 05

<A>
<BT>103050305
<V>100<H>200<BW>01233*ABCD*
<Q>2
<Z>

[Supplementary Explanation]

1. To print barcode with specified ratio, insert “Barcode print by specified ratio” command <BW> after this command.
2. When <BW> and the Print Quantity <Q> command are not specified, only the registration of bar width ratio of narrow and wide bars will be performed.
3. Only one ratio can be registered.
4. If the data other than specified is set, this will not be registered due to command error.
5. Matrix 2of5 is expressed as Coop2of5/NEC2of5.

10.6 Barcode

Available printer	China model	Thailand model	Vietnam model		

Barcode Print by Specified Ratio

ESC+BW

HEX code	ESC	BW	Parameter
	<1B>16	<42>16<57>16	aabbbn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies barcode ratio, saved by <BT>

[Format]

<BW>aabbbn - n

●Parameter

a [Narrow bar] = Valid Range : 01 – 12 dot

b [Barcode height] = Valid range : 001 to 999 dots

n [Print data] = Barcode data

[Coding Example] Narrow bar: 02, Height of Barcode:120

<A>

<BT>103060306

<V>100<H>200**<BW>02120*ABCD***

<Q>2

<Z>

[Supplementary Explanation]

1. Barcode character pitch is available for CODABAR(NW-7), CODE39, Industrial 2of5, Matrix 2of5.
   To specify barcode character pitch, insert Character Pitch <P> right before Barcode symbology. When <P> is omitted, character pitch will be as same as narrow space width set by Barcode ratio and multiple number of narrow bar width.
   e.g.)

Command	Ratio	Narrow space wicdth	<P>	Inter-character gap	
				Narrow bar width: 1	Narrow bar width: 1
<BT>	3:5	3	None	3	6
			<P>0	3	6
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. If there is no Registration of Bar Width Ratio <BT>, barcode based on pre-registered bar width ratio of narrow and wide bars will be printed. Note that specification of <BT> is required beforehand to print.
3. For print data for Barcode type, refer to Code table for each Barcode.

[Note]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. Barcode exceeds print area is not printed.
3. Increasing narrow bar width may exceed the print area and not be printed..
4. Scanner may not read the barcode with valid character pitch when Character Pitch <P> is increased. Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. For specifying the narrow bar width, consider the reading compatibility of scanner beforehand.
6. Adjust Print Speed <CS> or Print Darkness <#E> in case of scanner reading problem.
7. Matrix 2of5 is expressed as Coop2of5/NEC2of5.
8. When CODABAR(NW-7) and CODE39 is specified and Start/Stop character is not included in it, Barcode is printed but Scanner cannot read it.

CODABAR(NW-7) Code table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0				0												
0	0	0	1	1				1	A		a									
0	0	1	0	2				2	B		b									
0	0	1	1	3				3	C		c									
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5				5	E		e									
0	1	1	0	6				6												
0	1	1	1	7				7												
1	0	0	0	8				8												
1	0	0	1	9				9												
1	0	1	0	A			*	:												
1	0	1	1	B			+													
1	1	0	0	C																
1	1	0	1	D			-													
1	1	1	0	E			.		N		n									
1	1	1	1	F			/													

*The specification doesn't allow using 0x20 (SP). Printing it doesn't cause error but print blank as a specification of the printer.

CODE39 Code table

					S					I				S				0			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0		P										
0	0	0	1	1				1	A	Q										
0	0	1	0	2				2	B	R										
0	0	1	1	3				3	C	S										
0	1	0	0	4			$	4	D	T										
0	1	0	1	5			%	5	E	U										
0	1	1	0	6				6	F	V										
0	1	1	1	7				7	G	W										
1	0	0	0	8				8	H	X										
1	0	0	1	9				9	I	Y										
1	0	1	0	A			*		J	Z										
1	0	1	1	B			+		K											
1	1	0	0	C					L											
1	1	0	1	D			−		M											
1	1	1	0	E			.		N											
1	1	1	1	F			/		O											

10.7 Barcode

Available printer	China model	Thailand model	Vietnam model		

GS1-128 (UCC/EAN128) <Standard Carton ID Only>

ESC+BI

HEX code	ESC	BT	Parameter
	<1B>16	<42>16<54>16	abbccddee
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies GS1-128(UCC/EAN128) barcode for Standard Carton ID.

[Format]
<BI>aabbbcn~n

●Parameter

a	[Narrow bar]	=	Valid Range	:	01 to 12 (dots)
b	[Barcode height]	=	Valid range	:	001 to 999 dots
c	[Barcode expository font specification]	=	0	:	No HRI
			1	:	HRI is available (Upper part of barcode)
			2	:	HRI is available (Under part of barcode)
n	[Print data]	=	Barcode data (Fixed 17 digits)		

For barcode data, refer to the GS1-128 (UCC/EAN128) code table.
EAN128 (Barcode for Standard Carton ID)
- Identifier of a continuous code for freight packaging
- Type of packaging
- Country/manufacturer code
- Serial No. for shipping container
- Check digit

Note that check digit is automatically added; therefore, specify data in 17 digits excluding check digit.

[Coding Example] Narrow bar width:05, Height of barcode:080, HRI: Available (Under part of barcode)
Print data:12345678901234567

<A>
<V>100<H>200**<BI>0508021234567890123456**7
<Q>2
<Z>

[Supplementary Explanation]
1. UCC128 code is exclusive to Standard Carton ID. When printing in EAN128, designed for the markets in the medical, fresh food, or flowers and plants, use CODE128 Barcode <BG> to specify print data with application identification or separator that matches each specification.
2. Start character code, function character, end character code, and identification code (corresponds to [00] only) are added automatically.
3. Modulus 10 check character and modulus 103 check character are automatically generated.
4. Sequential number of barcode data is available.
5. Line pitch between barcode and expository font is fixed at 10 dots.
6. If the width of expository font is wider than that of barcode, it starts printing from the print start position of barcode.
7. If the width of expository font is narrower than that of barcode, expository font will be aligned to the center of barcode for printing.
8. Prints expository font in OCR-B.
9. If expository font is outside of print area, it will not be printed. When selecting [HRI is available], specify Vertical Print Position <V> and Horizontal Print Position <H> in consideration of print of expository font.
10. Specifying other than 0, 1, or 2 for the font for HR will result the same as specifying 0.

ITF
Matrix 2of5
Industrial 2of5
UPC-A, JAN/EAN8
JAN/EAN13, UPC-E
GS1-128(UCC/EAN128)
MSI Code table

					S			I					S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0				0												
0	0	0	1	1				1												
0	0	1	0	2				2												
0	0	1	1	3				3												
0	1	0	0	4				4												
0	1	0	1	5				5												
0	1	1	0	6				6												
0	1	1	1	7				7												
1	0	0	0	8				8												
1	0	0	1	9				9												
1	0	1	0	A																
1	0	1	1	B																
1	1	0	0	C																
1	1	0	1	D																
1	1	1	0	E																
1	1	1	1	F																

10.8 Barcode

Available printer	China model	Thailand model	Vietnam model		

CODE 93 Barcode

ESC+BC

HEX code	ESC	BC	Parameter
	<1B>16	<42>16<43>16	aabbbccn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies CODE93 barcode.

[Format]

<BC>aabbbccn~n

●Parameter

a	[Narrow bar]	=	Valid Range	:	01 ~ 12 dots
b	[Barcode height]	=	Valid range	:	001 to 999 dots
c	[Digit No. of data]	=	Valid Range	:	01 ~ 99
n	[Print data]	=	Barcode data(Refer to the CODE93 - Code Table.)		

[Coding Example] Narrow bar width: 02, Barcode height: 120, Number of digit: 12, Print data: ABCD123456xy

<A>

<V>100<H>200**<BC>0212012ABCD123456xy**

<Q>2

<Z>

[Supplementary Explanation]

1. C/D is an auto-generation.
2. Start code and stop code are added automatically.
3. Maximum entry digit number of data is 99.
4. [Digit No. of data] and No. of input data have to be equal.
5. Command error will occur when No. of input data and [Digit No. of data] are not matched.

CODE93　Code table

					S					I				S							0
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2			″	2	B	R	b	r								
0	0	1	1	3			#	3	C	S	c	s								
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5			%	5	E	U	e	u								
0	1	1	0	6			&	6	F	V	f	v								
0	1	1	1	7			’	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	x								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	¥	l	|								
1	1	0	1	D			−	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o	DEL								

You can specifiy from 00H to 7FH for Code93.

10.9 Barcode

Available printer	China model	Thailand model	Vietnam model		

Code 128 Barcode

ESC+BG

HEX code	ESC	BG	Parameter
	<1B>16	<42>16<47>16	aabbbn~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies CODE128 barcode.

[Format]
<BG>aabbbn~ n

●Parameter

a	[Narrow bar]	=	Valid Range	:	01 ~ 12 dots
b	[Barcode height]	=	Valid range	:	001 to 999 dots
n	[Print data]	=	Barcode data (Refer to the CODE128 - Code Table)		

[Coding Example] Narrow bar width: 02, Barcode height: 120, Print data: ABCD123456 (Start character A)

<A>
<V>100<H>200**<BG>02120>GABCD123456**
<Q>2
<Z>

[Supplementary Explanation]

1. Specify [START CODE] at the head of print data.
   (1) START CODE A = [>G]
   (2) START CODE B = [>H]
   (3) START CODE C = [>I]
2. C/D is an auto-generation.
3. (1) When using “START CODE C”, specify print data in even-numbered digit.
   (2) When “START CODE C” is set to print data in odd-number digit, specify “START CODE A” or “B” to change the first one character of print data. And then specify the rest of data with “Code Set Character C” to change it to even-numbered digit.
   e.g.1) 15 digits [123456789012345] <B>1<C>23456789012345.
   e.g.2) 9 digits / Alphanumeric 6 digits [123456789ABC123] <C>12345678<B>9ABC123.
   (3) If using “START CODE C” to specify odd-numbered digit, command error occurs and barcode is not printed.
   (4) Note that if using “START CODE C” to specify odd-numbered digit, and compatible mode is ON, “0” will be added to the tail of print data before printing.
   (5) When start character is omitted, data will be printed with “START CODE B”.

CODE128　Code table

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

VALUE	Code A	Code B	Code C
49	Q	Q	49
50	R	R	50
51	S	S	51
52	T	T	52
53	U	U	53
54	V	V	54
55	W	W	55
56	X	X	56
57	Y	Y	57
58	Z	Z	58
59	[	[	59
60	＼	＼	60
61	]	]	61
62	^	^	62
63	_	_	63
64	NUL >SP	‘ >SP	64
65	SOH >!	A >!	65
66	STX >”	B >”	66
67	ETX >#	C >#	67
68	EOT >$	D >$	68
69	ENQ >%	E >%	69
70	ACK >&	F >&	70
71	BEL >’	G >’	71
72	BS >(	H >(	72
73	HT >)	I >)	73
74	LF >*	J >*	74
75	VT >+	K >+	75
76	FF >,	L >,	76
77	CR >-	M >-	77
78	SO >.	N >.	78
79	SI >/	O >/	79
80	DLE >0	P >0	80
81	DC1 >1	Q >1	81
82	DC2 >2	R >2	82
83	DC3 >3	S >3	83
84	DC4 >4	T >4	84
85	NAK >5	U >5	85
86	SYN >6	V >6	86
87	ETB >7	W >7	87
88	CAN >8	X >8	88
89	EM >9	Y >9	89
90	SUB >:	Z >:	90
91	ESC >;	{ >;	91
92	FS ><	| ><	92
93	GS >=	} >=	93
94	RS >>	～ >>	94
95	US >?	DEL >?	95
96	FNC3 >@	FNC3 >@	96
97	FNC2 >A	FNC2 >A	97

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

Note

1. START code must be sent.
2. STOP code is added in the printer automatically.
3. Code after VALUE64 in Code A and Code B should be specified as 2 character code with “>” attached.
4. Specification code for “>” is “>J”.

10.10 Barcode

Available printer	China model	Thailand model	Vietnam model		

Postnet Barcode

ESC+BP

HEX code	ESC	BP	Parameter
	<1B>16	<42>16<50>16	n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies Postnet barcode.

[Format]
< BP>n~n

●Parameter
n = Print data (See Postnet Code table in next page)
* Follow the rule of the maximum data length for each format.
- 5 digits (Postnet-32 format)
- 6 digits (Postnet-37 format)
- 9 digits (Postnet-52 format)
- 11 digits (Postnet-62 Delivery Point format)

[Coding example] Postal code 11 digits : 01234567890
<A>
<V>100<H>200**<BP>01234567890**
<Q>2
<Z>

[Supplementary Explanation]
1. Data length other than 5, 6, 9, and 11digits will be invalid.
2. Only numeric can be specified for print data.

Postnet Code table

					S								S				O			
				b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	**b3**	**b2**	**b1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

10.11 Barcode

Available printer	China model	Thailand model	Vietnam model		

UPC-A
(Without Human-Readable Information)

ESC+BL

HEX code	ESC	BL	Parameter
	<1B>16	<42>16<4C>16	aabbcccn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Set the height of character barcode of the first digit and the last digit to the same height of the guard bar.

[Format]
〈BL〉abbcccn~n

●Parameter

a	[Barcode type]	=	H	:	UPC-A(Fixed 'H')
b	[Narrow bar]	=	Valid Range	:	01~12 dots
c	[Barcode height]	=	Valid range	:	001 to 999 dots
n	[Print data]	=	Data	:	11 fixed digits

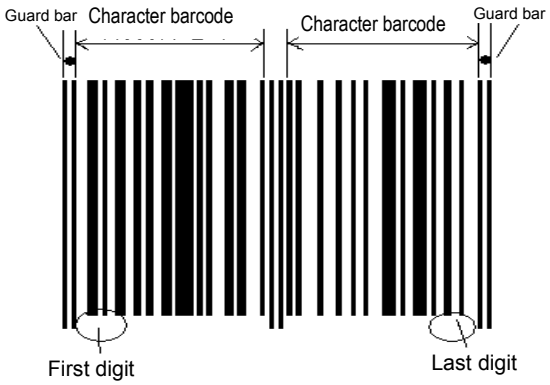
[Coding Example] Barcode type： UPC-A, Narrow bar width：03, Barcode height：120, Print data： 01234567890

<A>
<H>100<V>100**<BL>H0312001234567890**
<Q>2
<Z>

[Supplementary Explanation]
1. This command supports UPC-A only. When barcode type is specified other than “H”, command error occurs.
2. Setting of Guard bar, HRI and ratio is described as follows.

Guard bar	HRI	Ratio
Available	Nil	Fix

3. When the parameter value exceeds the range, operation is not supported.
4. When printing UPC-A with <D>, all character barcodes have the same height. When <BL> is uses, the height of the character barcode of the start digit and the last digit have the same height of the guard bar.



UPC-A specifying <D>

UPC-A specifying <BL>

10.12 Barcode

Available printer	China model	Thailand model	Vietnam model		

UPC-A (With Human-Readable Information)	ESC+BL ~ ESC+d

HEX code	ESC	BL~d	Parameter
	<1B>16	<42>16<4C>16~character type	abbcccn~n~<d>n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Set the height of character barcode of the first digit and tha last digit to the same height of the guard bar.

[Format]
<BL>abbcccn~n~<d>n~n

●Parameter

a	[Barcode type]	=	H	:	UPC-A (Fixed 'H)
b	[Narrow bar]	=	Valid Range	:	01~12 dots
c	[Barcode height]	=	Valid range	:	001 to 999 dots
n	[Print data]	=	Data	:	Fixed 11 digit *1
d	[Font type]	=	XU XS XM XB XL OA OB XV1 *2 XV2 *2 XV3 *2		
n	[Print data]	=	HRI data: fixed 12 digits		

*1 The number of digit of UPC-A is eleven. If twelve numbers are specified, the first digit is ignored and barcode is created with rest of eleven numbers.
*2 Only available for Vietnam model.

[Coding Example] Barcode type: UPC-A, Narrow bar width: 02. Barcode height: 120, Print data: 01234567890
Font type: X21, HRI data: 01234567890

```
<A>
<H>100<V>100<BL>H0212001234567890
<XS>01234567890
<Q>2
<Z>
```

[Supplementary Explanation]

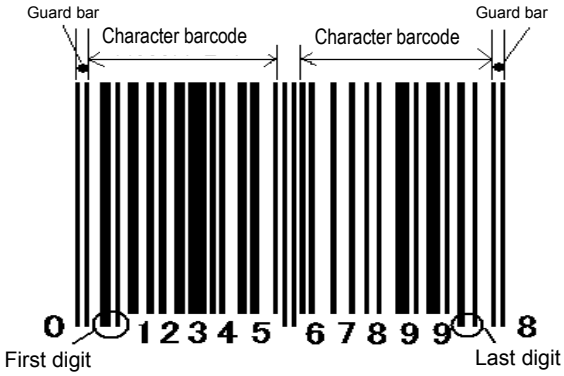
1. This command supports UPC-A only. When barcode type is specified other than “H”, command error occurs.
2. HRI should be set as follows.
   8dot/mm: Set Narrow bar width to [02] or [03」
3. Check digit (12th digit) for HRI data should be set the calculation result of modulus 10.
4. Setting of Guard bar, HRI and Ratio is following.

Guard bar	HRI	Ratio
Available	Available	Fix

5. When the parameter value exceeds the range, operation is not supported.
6. HRI will not be printed when the barcode with HRI has an error.

7. All character barcode have the same height when printing UPC-A specifying <D> and then <font>. The first and the last character barcode have the same height to the guard bar when printing UPC-A specifying <BL> and then <font>.
   When printing UPC-A specifying <D> and <font>, HRI can be printed under the first digit and the last digit because the height of the first digit and the last digit of the barcode is low. When printing UPC-A specifying <BL> and <font>, the height of the first digit and the last digit of the barcode is high, and the font interval is narrower than previous case.

UPC-A specifying <D> + <font>



UPC-A specifying <BL> + <font>

10.13 Barcode

Available printer	China model	Thailand model	Vietnam model		

UPC-A
(With Human-Readable Information)

ESC+BM

HEX code	ESC	BM	Parameter
	<1B>16	<42>16<4D>16	abbcccn~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Set the character barcode height of the first and the last digit to the same height of the guard bar.

[Format 1]
<BM>abbcccn~n
●Parameter

a	[barcode type]	=	H	: UPC-A(fixed 'H')
b	[Narrow bar]	=	Valid Range	: 01~12 dots
c	[Barcode height]	=	Valid range	: 001 to 999 dots
n	[Print data]	=	Data	: fixed 11 dight*

*1 The number of digit of UPC-A is eleven. If twelve numbers are specified, the first digit is ignored and barcode is created with rest of eleven numbers.

[Coding Example] Barcode type:UPC-A, Narrow bar width:02, Barcode height :120, Print data: 20123948573
<A>
<H>100<V>100**<BM>H0212020123948573**
<Q>2
<Z>

[Supplementary Explanation]
1. This command supports UPC-A only. When barcode type is specified other than “H”, command error occurs.
2. HRI needs following conditions;
Set Narrow bar width to [02] or [03]
When the value other tham above are specified, HRI is not printed.
3. Setting of Guard bar, HRI and Ratio is following.

Guard bar	HRI	Ratio
Available	Available	Fix

4. When the parameter value exceeds the range, operation is not supported.
5. All character barcode have the same height when printing UPC-A specifying <D> and then <font>. The first and the last character barcode have the same height to the guard bar when printing UPC-A specifying <BL> and then <font>.

When printing UPC-A specifying <D> and <font>, HRI can be printed under the first digit and the last digit because the height of the first digit and the last digit of the barcode is low. When printing UPC-A specifying <BL> and <font>, the height of the first digit and the last digit of the barcode is high, and the font interval is narrower than previous case.

UPC-A specifying <BD>

UPC-A specifying <BM>

11 2D Barcode

11.1 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

PDF417	ESC+2D10

HEX code	ESC	2D10	Parameter
	<1B>16	<32>16<44>16<31>16<30>16	,aa,bb,c,dd,ee(,f)
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies PDF417

[Format](Setting part)
<2D10>,aa,bb,c,dd,ee(,f)
●Parameter

a	[Minimum module width]	=	Valid Range	: 01 ~ 09 dots
b	[Minimum module height]	=	Valid Range	: 01 ~ 24 dots
c	[Security level]	=	Valid Range	: 0 ~ 8
d	[Number of data code words per one line]	=	Valid Range	: 01 ~ 30 00 : Automatic(Width varies depending on number of data)
e	[Number of line per symbol]	=	Valid Range	: 03 ~ 90 00 : Automatic(Height varies depending on number of data)
f	[Code type]	=	0 Normal, When omitted 0(can be omitted) 1	: Truncated

[Format](Data part)
<DN>mmmm,n~n
●Parameter

m	[Number of data]	=	Valid Range	: 1 ~ 2681 bytes
n	[Print data]	=	Data	

[Coding Example1] Minimum module width: 03 dots, Minimum module height: 09 dots
Security level: 3, Number of data code words per line: 03, Number of line per symbol: 18

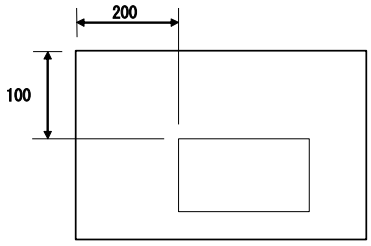
<A>
<V>100<H>200**<2D10>,03,09,3,03,18**
<DN>0010,0123456789
<Q>2
<Z>

[Coding Example2] Minimum module width: 03 dots, Minimum module height: 09 dots
Security level: 3, Number of data code words per line: 03, Number of line per symbol: 18
Code type: Truncated

<A>
<V>100<H>200**<2D10>,03,09,3,03,18,1**
<DN>0010,0123456789
<Q>2
<Z>

[Supplementary Explanation]

1. Base print position of PDF417 is specified by vertical print position<V> and horizontal print position<H>
   <V>100<H>200<2D10>*** ・・・・・・・**



2. When d=e=00, aspect ratio will be at 1:2 based on the number of print data.
3. When parameter d and e doesn't match number of data, print may not be performed properly.
4. When specifying security level height, parameter d or e should have large number.
5. Minimum module width can be set to 01 and 02; however, this may not be read properly.
6. 01, 02, and 03 are designable for Minimum module height however, it may cause a reading problem.

[Point]

1. Sequential number is not available.
2. Specifies print position by automatic line feed is not available.
3. Print 00H~FFH is available.
4. Enlarging minimum module size improves print quality.
5. Increasing security level improves read rate.
6. Print height varies depending on the character such as numeric only, alphabet only or mixture of numeric and alphabets.

PDF417　Code table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2			″	2	B	R	b	r								
0	0	1	1	3			#	3	C	S	c	s								
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5			%	5	E	U	e	u								
0	1	1	0	6			&	6	F	V	f	v								
0	1	1	1	7			’	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	x								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	¥	l	|								
1	1	0	1	D			−	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o	DEL								

[00H~FFH] can be available for PDF417.

11.2 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

Micro PDF417

ESC+2D12

HEX code	ESC	2D12	Parameter
	<1B>16	<32>16<44>16<31>16<32>16	,aa,bb,c,dd(,e)
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies Micro PDF417.

[Format](Setting part)

<2D12>,aa,bb,c,dd(,e)

●Parameter

a	[Minimum module width]	=	Valid Range: 01 ~ 09 dots
b	[Minimum module height]	=	Valid Range: 01 ~ 24 dots
c	[Number of data code words per rows] (Cols)	=	Valid Range: 1 ~ 4
d	[Number of rows per symbol]	=	Valid Range: 2 rows 行
e	[Binary mode]	=	0: Normal, When omitted 0 (Can be omitted) 1: Binary mode

[Format](Data part)

<DN>mmmm,n ~ n : Binary mode is Binary mode

<DS>n ~ n : Binary mode is Nornmal

●Parameter

m	[Number of data]	=	Valid Range: 0001 ~ 0366 bytes
n	[Print data]	=	Data

[Coding Example] Module width: 02 dots, Minimum module height: 04 dots
Data code word per rows: 1, Rows per symbol: 14

<A>
<V>100<H>200**<2D12>,02,04,1,14**
<DN>0010,0123456789
<Q>2
<Z>

[Supplementary Explanation]

1. Number of row per symbol is decided by number of data code words per row.For details, refer to “Symbol size and number of data for Micro PDF417” in next page.
2. Minimun module width and minimum module height may cause reading problem . Specify more than 02 dots.
3. Generated module has been changed for improving the quality. Generated image may be different from previous one, but the reading result is the same.

Note: Symbol size of Micro PDF417 has 34 types and shown in the table below.

Micro PDF417 - symbol size and number of data

Symbol size		Maximum number of data		
Cols(c)	Rows(d)	Alphabet(A-Z)	Numeric	Binary mode
1	11	6	8	3
	14	12	17	7
	17	18	26	10
	20	22	32	13
	24	30	44	18
	28	38	55	22
2	8	14	20	8
	11	24	35	14
	14	36	52	21
	17	46	67	27
	20	56	82	33
	23	64	93	38
	26	72	105	43
3	6	10	14	6
	8	18	26	10
	10	26	38	15
	12	34	49	20
	15	46	67	27
	20	66	96	39
	26	90	132	54
	32	114	167	68
	38	138	202	82
	44	162	237	97
4	4	14	20	8
	6	22	32	13
	8	34	49	20
	10	46	67	27
	12	58	85	34
	15	76	111	45
	20	106	155	63
	26	142	208	85
	32	178	261	106
	38	214	313	128
	44	250	366	150

* Way of mixing alphabets (Capital, lower case), numeric characters and control codes differs by combination of number of characters.

Micro PDF417 Code table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2			″	2	B	R	b	r								
0	0	1	1	3			#	3	C	S	c	s								
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5			%	5	E	U	e	u								
0	1	1	0	6			&	6	F	V	f	v								
0	1	1	1	7			’	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	x								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	¥	l	|								
1	1	0	1	D			−	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o	DEL								

Micro PDF417 can specify 00H~FFH.

11.3 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

MaxiCode

ESC+2D20

HEX code	ESC	2D20	Parameter
	<1B>16	<32>16<44>16<32>16<30>16	,a(,bbb,ccc,d~d)
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies MaxiCode.

[Format](Setting part)
<2D20>,a(,bbb,ccc,d~d)
●Parameter

a	[Mode]	=	2	:	Transportation (Numeric)
			3	:	Transportation (Alphanumeric)
			4	:	Standard symbol
			6	:	Reader programing

* Following parameter must be specified when specifying mode 2 or mode 3.
When specifying mode 4 or mode 6, the parameter sould be omitted.

b	[Service class]	=	Valid Range	:	001 ~ 999 (Numeric)
c	[Country code]	=	Valid Range	:	001 ~ 999 (Numeric)
d	[Postal code]	=	Valid Range	:	0 ~ 999999999 (Mode 2)
					000000 ~ 999999 (Mode 3)
					* Mode 2: Max 9 digits (Numeric only)
					Mode 3: Fixed 6 digits (Capital alphabet)

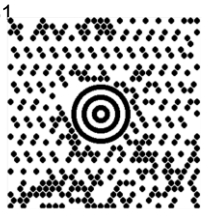
[Format](Data part)
<DN>mmmm,n~n
●Parameter

m	[Number of Data]	=	Valid Range	:	1 ~ 138
n	[Print data]	=	Data		
			※00H can not be specified.		

Mode	Service class	Country code	Postal code	Maximum print data	
					Alphanumericl
2	Fixed 3 digits (Numeric only)	Fixed 3 digits (Numericl only)	Max. 9 digits	123	84
3			Fixed 6 digits (Alphanunumeric)		
4	Omission			138	93
6					

[Coding Example] Mode: Transportation (Numericl only), Service class: 003, Country code: 081
Postal code: 123456789

<A>
<V>100<H>200**<2D20>,2,003,081,123456789**
<DN>0010,0123456789
<Q>2
<Z>



[Supplementary Explanation]
1. Size of MaxiCode is not chaged by number of data for printing.
2. If parameter that is not described above is used, or print data doesn't match, symbol is not printed.
3. When specifying mode 4 and mode 6, number of print data must be specified over 12. When number of print data is specified less than 11, scanner cannot read printed MaxiCode.
4. When using print data other than alphanumeric, maximum number of print data varies depending on combination of print data.
5. Generated module has been changed for improving the quality. Generated image may be different from previous one, but the reading result is the same.

MaxiCode Code table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2			″	2	B	R	b	r								
0	0	1	1	3			#	3	C	S	c	s								
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5			%	5	E	U	e	u								
0	1	1	0	6			&	6	F	V	f	v								
0	1	1	1	7			’	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	x								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	¥	l	|								
1	1	0	1	D			−	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o	DEL								

MaxiCode can specify from 01H to FFH.

11.4 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

QR Code (Model 2)

ESC+2D30

HEX code	ESC	2D30	Parameter
	<1B>16	<32>16<44>16<33>16<30>16	,a,bb,c,d(,ee,ff,gg)
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies QR Code (Model 2)

[Format] (Setup part)
<2D30>,a, bb, c, d(,ee, ff, gg)

●Parameter

a [Error Correction Level] = L : 7%
M : 15%
Q : 25%
H : 30%

b [Size of one side of cell] = Valid Range : 01 ~ 32 dots

c [Data setup mode = 0 : Manual setup
1 : Automatic setup

* Note: You need to change the method of specifying print data with this setting.

d [Concatenation mode] = 0 : Normal mode
1 : Concatenation mode

Following parameter must be specified when specifying 1 (Concatenation mode) in Concatenation mode.
Omit following parameter in normal mode.

e [Number of partitions of concatenation mode] = Valid Range : 01 ~ 16

* Number of partitions: Specifies how many QR code are to be concatenated devided by Concatenation mode.

f [Sequential number partitioned by concatenation mode] = Valid Range : 01 ~ 16

* Sequential number: Specifies what number is it of devided QR code.

g [Concatenation mode parity data] = Valid Range : 00 ~ FF

* Parity data: Specifies exclusive OR of all the print data in devided QR code with HEX characters.

[Format] (Data part)

Manual setup (Data setup mod)
<DS>k,n~n * Use when input mode specification is Numeric mode, Alphanumeric mode and Kanji mode.
<DN>mmmm, n~n * Use when specifying by binary.

Automatic setup(Data setup mode)
<DN>mmmm, n~n * Change input mode automatically according to input data.

●Parameter

k [Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode (Shift JIS Kanji)

* Specify only when specifyng Manual setup in Data setting mode.
* There is binary specification other than above, but data specifycaton command is different.

m [Number of data] = Valid Range : 1 ~ 2953

* Specify when specifying Automatic setup in Data setting mode or specifying binary specification in Manual setup.

n [Print data] = Data

[Supplementary Explanation1]
1. When specifying Kanji in <DN>, specify size that is 2 X number of Kanji characters.
2. For <DN> in Automatic setup, when 80H~9FH and E0H~FFH is specified as data, it is handed as Kanji mode, and cannot specify them as binary.

[Coding Example1] Error correction level: 7%, Size of one side of cell: 05
Data setup mode: Manual setup, Concatenation mode: Normal

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

[Supplementary Explanation2]

1. If the parameter other than the description is specified or number of print data is not match, print is not executed.
2. Data specification command in data part varies according to parameter setup or specified data.

[Coding Example2] Error correction level: 7%, Size of one side of cell: 04
Mixed specification of Manual setup (Data setup mode)
In Manual setup, you can proceed specifying data in specified input mode (Numeric, Alphanumeric, Kanji, Binary).

<A>
<V>100<H>200
<2D30>,L,04,0,0
<DS>3,サトー
<DN>0010,0123456789
<DS>1,123
<Q>1
<Z>

[Supplementary Explanation3]

1. Parameter part to be followed by Data part. Data part and data part should be specified in a row. When don't specify in a row, print result may not be secured.
2. Total number of data (n) need to be less than 7000 bytes. Maximum number of blocks in data part specified in a row is 200.

QR Code data size list (Model 2)

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
1	L	41	25	10	17
	M	34	20	8	14
21 × 21	Q	27	16	7	11
	H	17	10	4	7
2	L	77	47	20	32
	M	63	38	16	26
25 × 25	Q	48	29	12	20
	H	34	20	8	14
3	L	127	77	32	53
	M	101	61	26	42
29 × 29	Q	77	47	20	32
	H	58	35	15	24
4	L	187	114	48	78
	M	149	90	38	62
33 × 33	Q	111	67	28	46
	H	82	50	21	34
5	L	255	154	65	106
	M	202	122	52	84
37 × 37	Q	144	87	37	60
	H	106	64	27	44
6	L	322	195	82	134
	M	255	154	65	106
41 × 41	Q	178	108	45	74
	H	139	84	36	58
7	L	370	224	95	154
	M	293	178	75	122
45 × 45	Q	207	125	53	86
	H	154	93	39	64
8	L	461	279	118	192
	M	365	221	93	152
49 × 49	Q	259	157	66	108
	H	202	122	52	84
9	L	552	335	141	230
	M	432	262	111	180
53 × 53	Q	312	189	80	130
	H	235	143	60	98
10	L	652	395	167	271
	M	513	311	131	213
57 × 57	Q	364	221	93	151
	H	288	174	74	119

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
11	L	772	468	198	321
	M	604	366	155	251
61 × 61	Q	427	259	109	177
	H	331	200	85	137
12	L	883	535	226	367
	M	691	419	177	287
65 × 65	Q	489	296	125	203
	H	374	227	96	155
13	L	1022	619	262	425
	M	796	483	204	331
69 × 69	Q	580	352	149	241
	H	427	259	109	177
14	L	1101	667	282	458
	M	871	528	223	362
73 × 73	Q	621	376	159	258
	H	468	283	120	194
15	L	1250	758	320	520
	M	991	600	254	412
77 × 77	Q	703	426	180	292
	H	530	321	136	220
16	L	1408	854	361	586
	M	1082	656	277	450
81 × 81	Q	775	470	198	322
	H	602	365	154	250
17	L	1548	938	397	644
	M	1212	734	310	504
85 × 85	Q	876	531	224	364
	H	674	408	173	280
18	L	1725	1046	442	718
	M	1346	816	345	560
89 × 89	Q	948	574	243	394
	H	746	452	191	310
19	L	1903	1153	488	792
	M	1500	909	384	624
93 × 93	Q	1063	644	272	442
	H	813	493	208	338
20	L	2061	1249	528	858
	M	1600	970	410	666
97 × 97	Q	1159	702	297	482
	H	919	557	235	382

QR Code data size list (Model 2)

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
21	L	2232	1352	572	929
	M	1708	1035	438	711
101 × 101	Q	1224	742	314	509
	H	969	587	248	403
22	L	2409	1460	618	1003
	M	1872	1134	480	779
105 × 105	Q	1358	823	348	565
	H	1056	640	270	439
23	L	2620	1588	672	1091
	M	2059	1248	528	857
109 × 109	Q	1468	890	376	611
	H	1108	672	284	461
24	L	2812	1704	721	1171
	M	2188	1326	561	911
113 × 113	Q	1588	963	407	661
	H	1228	744	315	511
25	L	3057	1853	784	1273
	M	2395	1451	614	997
117 × 117	Q	1718	1041	440	715
	H	1286	779	330	535
26	L	3283	1990	842	1367
	M	2544	1542	652	1059
121 × 121	Q	1804	1094	462	751
	H	1425	864	365	593
27	L	3517	2132	902	1465
	M	2701	1637	692	1125
125 × 125	Q	1933	1172	496	805
	H	1501	910	385	625
28	L	3669	2223	940	1528
	M	2857	1732	732	1190
129 × 129	Q	2085	1263	534	868
	H	1581	958	405	658
29	L	3909	2369	1002	1628
	M	3035	1839	778	1264
133 × 133	Q	2181	1322	559	908
	H	1677	1016	430	698
30	L	4158	2520	1066	1732
	M	3289	1994	843	1370
137 × 137	Q	2358	1429	604	982
	H	1782	1080	457	742

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
31	L	4417	2677	1132	1840
	M	3486	2113	894	1452
141 × 141	Q	2473	1499	634	1030
	H	1897	1150	486	790
32	L	4686	2840	1201	1952
	M	3693	2238	947	1538
145 × 145	Q	2670	1618	684	1112
	H	2022	1226	518	842
33	L	4965	3009	1273	2068
	M	3909	2369	1002	1628
149 × 149	Q	2805	1700	719	1168
	H	2157	1307	553	898
34	L	5253	3183	1347	2188
	M	4134	2506	1060	1722
153 × 153	Q	2949	1787	756	1228
	H	2301	1394	590	958
35	L	5529	3351	1417	2303
	M	4343	2632	1113	1809
157 × 157	Q	3081	1867	790	1283
	H	2361	1431	605	983
36	L	5836	3537	1496	2431
	M	4588	2780	1176	1911
161 × 161	Q	3244	1966	832	1351
	H	2524	1530	647	1051
37	L	6153	3729	1577	2563
	M	4775	2894	1224	1989
165 × 165	Q	3417	2071	876	1423
	H	2625	1591	673	1093
38	L	6479	3927	1661	2699
	M	5039	3054	1292	2099
169 × 169	Q	3599	2181	923	1499
	H	2735	1658	701	1139
39	L	6743	4087	1729	2809
	M	5313	3220	1362	2213
173 × 173	Q	3791	2298	972	1579
	H	2927	1774	750	1219
40	L	7089	4296	1817	2953
	M	5596	3391	1435	2331
177 × 177	Q	3993	2420	1024	1663
	H	3057	1852	784	1273

11.5 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

QR Code (Model 1)

ESC+2D31

HEX code	ESC	2D31	Parameter
	<1B>16	<32>16<44>16<33>16<31>16	,a,bb,c,d(,ee,ff,gg)
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies QR Code (Model 2)

[Format] (Setup part)
<2D30>,a, bb, c, d(,ee, ff, gg)

●Parameter

a [Error Correction Level] = L : 7%
M : 15%
Q : 25%
H : 30%

b [Size of one side of cell] = Valid Range : 01 ~ 32 dots

c [Data setup mode] = 0 : Manual setup
1 : Automatic setup

* Note: You need to change the method of specifying print data with this setting.

d [Concatenation mode] = 0 : Normal mode
1 : Concatenation mode

Following parameter must be specified when specifying 1 (Concatenation mode) in Concatenation mode.
Omit following parameter in normal mode.

e [Number of partitions of concatenation mode] = Valid Range : 01 ~ 16

* Number of partitions: Specifies how many QR code are to be concatenated divided by Concatenation mode.

f [Sequential number partitioned by concatenation mode] = Valid Range : 01 ~ 16

* Sequential number: Specifies what number is it of divided QR code.

g [Concatenation mode parity data] = Valid Range : 00 ~ FF

* Parity data: Specifies exclusive OR of all the print data in divided QR code with HEX characters.

[Format] (Data part)

Manual setup (Data setup mod)
<DS>k,n~n * Use when input mode specification is Numeric mode, Alphanumeric mode and Kanji mode.
<DN>mmmm, n~n * Use when specifying by binary.

Automatic setup (Data setup mode)
<DN>mmmm, n~n * Change input mode automatically according to input data.

●Parameter

k [Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode (Shift JIS Kanji)

* Specify only when specifying Manual setup in Data setting mode.
* There is binary specification other than above, but data specification command is different.

m [Number of data] = Valid Range : 1 ~ 486

* Specify when specifying Automatic setup in Data setting mode or specifying binary specification in Manual setup.

n [Print data] = Data

[Supplementary Explanation1]
1. When specifying Kanji in <DN>, specify size that is 2 X number of Kanji characters.
2. For <DN> in Automatic setup, when 80H~9FH and E0H~FFH is specified as data, it is handed as Kanji mode, and cannot specify them as binary.

[Coding Example1] Error correction level: 7%, Size of one side of cell: 05
Data setup mode: Manual setup, Concatenation mode: Normal

<A>
<V>100<H>200**<2D31>,L,05,0,0**
<DS>1,012345
<Q>2
<Z>

[Supplementary Explanation2]

1. If the parameter other than the description is specified or number of print data is not match, print is not executed.
2. Data specification command in data part varies according to parameter setup or specified data.

[Coding Example2] Error correction level: 7%, Size of one side of cell: 04
Mixed specification of Manual setup (Data setup mode)
In Manual setup, you can proceed specifying data in specified input mode (Numeric, Alphanumeric, Kanji, Binary).

<A>
<V>100<H>200
<2D31>,L,04,0,0
<DS>3,サトー
<DN>0010,0123456789
<DS>1,123
<Q>1
<Z>

[Supplementary Explanation3]

1. Parameter part to be followed by Data part. Data part and data part should be specified in a row. When don't specify in arow, print result may not be secured.

QR Code data size list (Model 1)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1	L	40	24	10	17
	M	33	20	8	14
21×21	Q	25	15	6	11
	H	16	10	4	7
2	L	81	49	20	34
	M	66	40	17	28
25×25	Q	52	31	13	22
	H	33	20	8	14
3	L	131	79	33	55
	M	100	60	25	42
29×29	Q	81	49	20	34
	H	52	31	13	22
4	L	186	113	48	78
	M	138	84	35	58
33×33	Q	114	69	29	48
	H	76	46	19	32
5	L	253	154	65	106
	M	191	116	49	80
37×37	Q	157	95	40	66
	H	105	63	27	44
6	L	321	194	82	134
	M	249	151	64	104
41×41	Q	201	122	51	84
	H	133	81	34	56
7	L	402	244	103	168
	M	311	188	80	130
45×45	Q	253	154	65	106
	H	167	101	43	70
8	L	493	299	126	206
	M	378	229	97	158
49×49	Q	301	183	77	126
	H	203	123	52	85
9	L	585	354	150	244
	M	441	267	113	184
53×53	Q	369	223	94	154
	H	239	145	61	100

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
10	L	690	418	177	287
	M	526	319	135	219
57×57	Q	433	262	111	180
	H	291	176	74	121
11	L	800	485	205	333
	M	608	368	156	253
61×61	Q	493	299	126	205
	H	342	207	87	142
12	L	915	555	234	381
	M	694	421	178	289
65×65	Q	579	351	148	241
	H	390	236	100	162
13	L	1030	624	264	429
	M	790	479	202	329
69×69	Q	656	398	168	273
	H	454	275	116	189
14	L	1167	707	299	486
	M	877	531	225	365
73×73	Q	738	447	189	307
	H	498	302	127	207

11.6 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

Micro QR Code

ESC+2D32

HEX code	ESC	2D32	Parameter
	<1B>16	<32>16<44>16<33>16<32>16	,a,bb,c
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifies QR Code (Micro QR Code)

[Format] (Setup part)
<2D32>,a,bb,c

●Parameter

a [Error Correction Level] = L : 7%
M : 15%
Q : 25%

b [Size of one side of cell] = Valid Range : 01 ~ 32 dots

c [Data setup mode = 0 : Manual setup
1 : Automatic setup

[Format] (Dat part)

Manual setup (Data setup mod)
<DS>k,n~n * Use when input mode specification is Numeric mode, Alphanumeric mode and Kanji mode.
<DN>mmmm, n~n * Use when specifying by binary.

Automatic setup (Data setup mode)
<DN>mmmm, n~n * Change input mode automatically according to input data.

●Parameter

k [Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode (Shift JIS Kanji)

* There is binary specification other than above, but data specification command is different.
m [Number of data」 = Valid Range : 1 ~ 15
* Specify when specifying Automatic setup in Data setting mode.
n [Print data] = Data

[Supplementary Explanation1]
1. When specifying Kanji in <DN>, specify size that is 2 X number of Kanji characters.
2. For <DN> in Automatic setup, when 80H~9FH and E0H~FFH is specified as data, it is handed as Kanji mode, and cannot specify them as binary.

[Coding Example1] Error correction level :7%, Size of one side of cell:04

<A>
<V>100<H>200**<2D32>,L,04**
<DS>1,012345
<Q>2
<Z>

[Supplementary Explanation]
1. If the parameter other than the description is specified or number of print data is not match, print is not executed.
2. Data specification command in data part varies according to parameter setup or specified data.

[Coding Example2] Error correction level: 7%, Size of one side of cell: 04

Mixed specification of Manual setup (Data setup mode)

In Manual setup, you can proceed specifying data in specified input mode (Numeric, Alphanumeric, Kanji, Binary) in a row.

<A>
<V>100<H>200
<2D32>,L,04,0
<DS>3,サトー
<DN>0010,0123456789
<DS>1,123
<Q>1
<Z>

[Supplementary Explanation3]

1. Parameter part to be followed by Data part. Data part and data part should be specified in a row. When don't specify in arow, print result may not be secured.

Micro QR Code Data size list

Version	Error correction	Numeric	Alphanumeric	Kanji	Binary
M1 (11x11)	L (Error detection only)	5	-	-	-
M2 (13x13)	L M	10 8	6 5	- -	- -
M3 (15x15)	L M	23 18	14 11	6 4	9 7
M4 (17x17)	L M Q	35 30 21	21 18 13	9 8 5	15 13 9

QR Code (Numeric mide) Code table

					S					I			S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0				0												
0	0	0	1	1				1												
0	0	1	0	2				2												
0	0	1	1	3				3												
0	1	0	0	4				4												
0	1	0	1	5				5												
0	1	1	0	6				6												
0	1	1	1	7				7												
1	0	0	0	8				8												
1	0	0	1	9				9												
1	0	1	0	A																
1	0	1	1	B																
1	1	0	0	C																
1	1	0	1	D																
1	1	1	0	E																
1	1	1	1	F																

QR Code (Alphanumeric mode) Code table

					S					I			S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0		P										
0	0	0	1	1				1	A	Q										
0	0	1	0	2				2	B	R										
0	0	1	1	3				3	C	S										
0	1	0	0	4			$	4	D	T										
0	1	0	1	5			%	5	E	U										
0	1	1	0	6				6	F	V										
0	1	1	1	7				7	G	W										
1	0	0	0	8				8	H	X										
1	0	0	1	9				9	I	Y										
1	0	1	0	A			*	:	J	Z										
1	0	1	1	B			+		K											
1	1	0	0	C					L											
1	1	0	1	D			-		M											
1	1	1	0	E			.		N											
1	1	1	1	F			/		O											

QR Code (Binary mode) Code table

					S					I			S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	P								
0	0	0	1	1			!	1	A	Q	A	Q								
0	0	1	0	2			″	2	B	R	B	R								
0	0	1	1	3			#	3	C	S	C	S								
0	1	0	0	4			$	4	D	T	D	T								
0	1	0	1	5			%	5	E	U	E	U								
0	1	1	0	6			&	6	F	V	F	V								
0	1	1	1	7			’	7	G	W	G	W								
1	0	0	0	8			(	8	H	X	H	X								
1	0	0	1	9			)	9	I	Y	I	Y								
1	0	1	0	A			*	:	J	Z	J	Z								
1	0	1	1	B			+	;	K	[	K	{								
1	1	0	0	C			,	<	L	¥	L	|								
1	1	0	1	D			−	=	M	]	M	}								
1	1	1	0	E			.	>	N	^	N	—								
1	1	1	1	F			/	?	O	_	O	DEL								

QR Code can specify from 00H to 7FH, and from A0H to DFH.

11.7 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

DataMatrix (ECC200)

ESC+2D50

HEX code	ESC	2D50	Parameter
	<1B>16	<32>16<44>16<35>16<30>16	,aa,bb,ccc,ddd
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies DataMatrix Code (ECC200).

[Format] (Setup part)

<2D50>,aa,bb,ccc,ddd

●Parameter

a	[Horizontal cell size]	=	Valid Range	:	01 ~ 16 dots
b	[Vetical cell size]	=	Valid Range	:	01 ~ 16 dots
c	[Number of cell in one line]	=	Valid Range	:	010~144
			000	:	(Auto-setting)
d	[Number of cell lines]	=	Valid Range	:	008~144
			000	:	(Auto-setting)

[Format] (Data part)

<DN>mmmm,n~n

●Parameter

m	[Number of data]	=	Valid Range	:	1 ~ 3116
n	[Print data]	=	Data		

*When print 7EH, specify ”7EH, 7EH”

*If Parameter other than above is specified or print data don’t match, print is not secured.

[Coding Example] Horizontal cell size: 3 dots, Vertical cell size: 3 dots

<A>

<V>100<H>200**<2D50>,03,03,000,000**

<DN>0010, 0123456789

<Z>

[Supplementary Explanation]

1. If Parameter other than above is specified or print data don’t match, print is not executed
2. When specifying print format, secure more than 2mm blank space in for sides of the DataMatrix for read margin for the scanner.
3. When print data is 7EH, specify ”7EH, 7EH”Number of data will be “0002”.
4. When Auto setup (000) is applied for [Number of cell in one row] and [Number of cell lines] , square DataMatrix is printed

	Data format	Number of data
Data format	Numeric	3116
	Alphanumeric	2335
	Binary (00H~FFH)	1556

*Symbol size of DataMatrix (ECC200) is following 30 types.

Symbol size and number of data of DataMatrix(ECC200)

Symbol size			Maximum data digits		
Number of cell in one line(c)	Number of cell line(d)	Number of block	Numeric	Alphanumeric	Briary
10	10	1	6	3	1
12	12	1	10	6	3
14	14	1	16	10	6
16	16	1	24	16	10
18	18	1	36	25	16
20	20	1	44	31	20
22	22	1	60	43	28
24	24	1	72	52	34
26	26	1	88	64	42
32	32	4	124	91	60
36	36	4	172	127	84
40	40	4	228	169	112
44	44	4	288	214	142
48	48	4	348	259	172
52	52	4	408	304	202
64	64	16	560	418	278
72	72	16	736	550	366
80	80	16	912	682	454
88	88	16	1152	862	574
96	96	16	1392	1042	694
104	104	16	1632	1222	814
120	120	36	2100	1573	1048
132	132	36	2608	1954	1302
144	144	36	3116	2335	1556
18	8	1	10	6	3
32	8	2	20	13	8
26	12	1	32	22	14
36	12	2	44	31	20
36	16	2	64	46	30
48	16	2	98	72	47

*Mixture of Numeric, Alphanumeric and Control code varies according to number of characters.

DataMatrix Code table

					S				I				S				0			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	P								
0	0	0	1	1			!	1	A	Q	A	Q								
0	0	1	0	2			”	2	B	R	B	R								
0	0	1	1	3			#	3	C	S	C	S								
0	1	0	0	4			$	4	D	T	D	T								
0	1	0	1	5			%	5	E	U	E	U								
0	1	1	0	6			&	6	F	V	F	V								
0	1	1	1	7			’	7	G	W	G	W								
1	0	0	0	8			(	8	H	X	H	X								
1	0	0	1	9			)	9	I	Y	I	Y								
1	0	1	0	A			*	:	J	Z	J	Z								
1	0	1	1	B			+	;	K	[	K	{								
1	1	0	0	C			,	<	L	¥	L	|								
1	1	0	1	D			-	=	M	]	M	}								
1	1	1	0	E			.	>	N	^	N	~								
1	1	1	1	F			/	?	O	_	O	DEL								

DataMatrix can specify from 00H to ~FFH.

When print 7EH, specify ”7EH, 7EH”

11.8 2D Barcode

Available printer	China model	Thailand model	Vietnam model		

GS1 DataMatrix

ESC+2D51

HEX code	ESC	2D51	Parameter
	<1B>16	<32>16<44>16<35>16<31>16	,aa,bb,ccc,ddd
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies GS1 DataMatrix Code.

[Format] (Setup part)

<2D51>,aa,bb,ccc,ddd

●Parameter

a	[Horizontal cell size]	=	Valid Range	:	01 ~ 16 dots
b	[Vertical cell size]	=	Valid Range	:	01 ~ 16 dots
c	[Number of cell in one line]	=	Valid Range	:	010~144
			000	:	(Auto-setting)
d	[Number of cell lines]	=	Valid Range	:	008~144
			000	:	(Auto-setting)

[Format] (Data part)

<DN>mmmm,n~n

●Parameter

m	[Number of data]	=	Valid Range	:	1~ 3116
n	[Print data]	=	Data		

*When print 7EH, specify [7EH, 7EH]

*When print 1BH, specify [1BH, 1BH].

*When print FNC1, specify [“BH, 31H].

*If Parameter other than above is specified or print data don’t match, print is not secured.

[Coding Example] Horizontal cell size: 3 dots, Vertical cell size: 3 dots

<A>

<V>100<H>200**<2D51>,03,03,000,000**

<DN>0014, <1B>16100123456789

<Z>

*<1B>16 specify character code “1BH”.

[Supplementary Explanation]

1. If Parameter other than above is specified or print data don’t match, print is not executed.
2. When specifying print format, secure more than 2 mm blank space in for sides of the DataMatrix for read margin for the scanner.
3. When print data is 7EH, specify [7EH, 7EH]. Number of data will be “0002”.
4. Specifying [7EH] alone becomes command error and doesn’t perform printing.
5. When print data is 1BH, specify [1BH, 1BH]. Number of data will be “0002”.
6. When print data is FNC1, specify [1BH, 31H]. Number of data will be “0002”.
7. Specifying [1BH] alone becomes command error and doesn’t guarantee printing and its content.
8. Setting “000” to [number of cell per one line] and [number of line] prints square symbol.
9. Setting the same number other than “000” to [number of cell per one line] and [number of line] prints square symbol (manual setting).
10. Setting the different numbers other than “000” to [number of cell per one line] and [number of line] prints rectangular symbol (manual setting).

11. Available number of data in the data part depends on the data format and shown in the table below.
(When setting the number of cell automatically or specifying the maximum number ofcell) :

	Data format	Number of data
Data format	Numeric	3116
	Alphanumeric	2335
	Binary (00H~FFH)	1556

12. Reducing cell size may cause read problem depending on the performance of the scanner. In case that happens, specify bigger cell size so that the scanner can read.
13. Available symbol size of GS1 DataMatrix is 30 shown in the table below. Also upper limit of number of data by the symbol size is shown in the table below.
14. Be sure to specify 1BH and 31H for the top of the data part.

[Symbol size and number of data of GS1 DataMatrix.]

Symbol size			Maximum data digits		
Number of cell in one line(c)	Number of cell line(d)	Number of block	Numeric	Alphanumeric	Briary
10	10	1	6	3	1
12	12	1	10	6	3
14	14	1	16	10	6
16	16	1	24	16	10
18	18	1	36	25	16
20	20	1	44	31	20
22	22	1	60	43	28
24	24	1	72	52	34
26	26	1	88	64	42
32	32	4	124	91	60
36	36	4	172	127	84
40	40	4	228	169	112
44	44	4	288	214	142
48	48	4	348	259	172
52	52	4	408	304	202
64	64	16	560	418	278
72	72	16	736	550	366
80	80	16	912	682	454
88	88	16	1152	862	574
96	96	16	1392	1042	694
104	104	16	1632	1222	814
120	120	36	2100	1573	1048
132	132	36	2608	1954	1302
144	144	36	3116	2335	1556
18	8	1	10	6	3
32	8	2	20	13	8
26	12	1	32	22	14
36	12	2	44	31	20
36	16	2	64	46	30
48	16	2	98	72	47

*Mixture of Numeric, Alphanumeric and Control code varies according to number of characters.

12 Graphic Command

12.1 Graphic

Available printer	China model	Thailand model	Vietnam model		

Graphic Print	ESC+G

HEX code	ESC	G	Parameter
	<1B>16	<47>16	abbbcccn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies the print of graphic.

[Format]

<G>abbbcccn~n

●Parameter

a [Data specification by HEX and BIN]

H: Hex data Divide 8 bits data into 4 bits and output it as hex code corresponding to ASCII.

B: Binary data Output 8 bits data as one font of data all at once.

b [Specification of crosswise graphic area per byte] = Valid range: Refer to the table below

c [Specification of lengthwise graphic area per byte] = Valid range: Refer to the table below

n [Graphic data]

[Coding Example]

<A>

<V>50<H>50**<G>H02000288888888…8888**

<Q>2

<Z>

[Supplementary Explanation]

1. Specification of [B] has longer program description than that of specification [H]; however, transfer data length is 50 percent shorter. This could be advantage in data capacity.
2. Specification of Rotation <%> and Enlargement <L> are available.
3. <L> command should be placed just before <G> command.
4. When using rotation <%> and enlargement <L> commands at the same time, specify <%> command before <L>.
5. Maximum horizontal byte and vertical horizontal byte are define in the table below, and can be specified up to 999 bytes to maintain compatibility with old model. Graphic data can be printed up to 2,937,600 bytes.
6. Size of graphic data is calculated as [Horizontal maximum dot x Vertical maximum dot x 8].
7. Specify digit number according to font because specific digit number shall be used for parameter a,b,c. If wrong digit number is specified, it is recognized as next parameter (or previous parameter).

[Valid Range]

Head density	Crosswise max. bytes	Lengthwise max. bytes
8 dots/mm (203dpi)	055	999

12.2 Graphic

Available printer	China model	Thailand model	Vietnam model		

BMP File Print

ESC+GM

HEX code	ESC	GM	Parameter
	<1B>16	<47>16<4D>16	aaaaa,n~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies the print or BMP file created by such as Paint Brush of Windows.

[Format]

<GM>aaaaa,n~n

●Parameter

a [Total bytes of BMP file]

n [Data]

[Coding Example]

<A>

<V>50<H>50**<GM>04500>, <424000~00>16**

<Q>2

<Z>

[Supplementary Explanation]

1. Data is sent in binary data (Outputs 8-bit data as 1 font data all at once) (Total byte size corresponds to filesize BMP file and BMP file data corresponds to data).
2. In BMP file, first 62-byte data is for the header part and the rest of data is compressed.
3. When [Total bytes of BMP file] is not matching the transfer data, this may become the cause of malfunction.
4. Total bytes are the file size displayed at [Property] and such.
5. BMP file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for BMP compressed file.Make sure that the file extension is set to [BMP] before printing.
6. Rotation <%> and Enlargement <L> are available.
7. Enlarge command <L> should be placed just before this command.
8. When using rotation <%> and enlargement <L> commands at the same time, specify <%> command before <L>.
9. The maximum byte of BMP file is 879120 bytes.

13 System Command

13.1 System

Available printer	China model	Thailand model	Vietnam model		

Print Speed	ESC+CS

HEX code	ESC	CS	Parameter
	<1B>16	<43>16<53>16	aa
Initial value	Refer to the table below.		

Valid range and term of command	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Specifies the speed of printing.

[Format]
<CS>aa
●Parameter
a [Print speed] = Refer to the table below

[Coding Example]
<A>
<CS>4
<Z>

[Supplementary Explanation]
1. Print darkness value specified by the command or LCD is maintained.

[Notes]
1. If the value over valid range is specified, command error will occur and print speed will not be changed.
2. Use default set operation of the printer to set back the value to the initial one.

[Parameter Initial Value and Specified Range]

Head density	Initial value [aa]	Parameter Valid Range	Print speed corresponding to parameter
8 dots/mm (203dpi)	4	4,5,6	4:4 (inches/sec) 100 (mm/s) 5:5 (inches/sec) 125 (mm/s) 6:5.6 (inches/sec) 140 (mm/s)

13.2 System

Available printer	China model	Thailand model	Vietnam model		

Print Darkness — ESC+#F

HEX code	ESC	#F	Parameter
	<1B>16	<23>16<45>16	ab(,cd) or aab(,ccd)
Initial value	Refer to the table below.		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Specifies print darkness.

[Format1]
<#F>ab
<#F>aab

●Parameter
a [Print darkness level specification1] = Valid range : Refer to the table below
b [Print darkness specification1] = A only. Use[A]

[Format 2] Specify darkness of barcode with small coverage rate/ 2D code separately.
<#F>ab(,cd)
<#F>aab(,ccd)

●Parameter
a [Print darkness level specification1] = Valid range : Refer to the table below
b [Print darkness specification1] = A only. Use[A]
a [Print darkness level specification2] = Valid range : Refer to the table below
b [Print darkness specification2] = A-B(Able to omit) . Use[A] under normal conditions.

[Coding Example 1]
<A>
<#F>5A
<Z>

[Coding Example 2] 8A for darkness of barcode/2D code, 5A for others.
<A>
<#F>5A,8A
<Z>

[Supplementary Explanation]
1. Print darkness value specified by the command or LCD is maintained.
2. Specify darkness of barcode 2D code separately with format 2.
3. Value of parameter a.b is set to darkness of barcode/2D code with setting of format 1.
4. Command error occurs and darkness is not changed when either parameter (parameter c or d) is excluded.
5. Parameter c must be larger than parameter a. If parameter c is smaller than a, parameter c will contain the value of and parameter d will contain the value of b.
5. In format 2, darkenss of barcode with big coverage rate/darkness of 2D barcode can be set with parameter a, b.Big coverage means 50% or more of head width for barcode/2D barcode

[Notes]
1. Command error occurs and darkess is not changed by specifying other value than value in setting range
2. Initial value can be set by factory setting in initialization mode for setting a printer or operation of printer setting.
3. Setting can be checked in test printing or [Printing setting] of [Basic setting].

[Print darkness level 1 range]

Model	Default	Parameter valid range	When setting of valid range
VP208	5	1,2,3,4,5,6,7,8,9,10 Light ⟶ Dark	Command error will occur when setting outside of valid range.

[Print darkness1 range]

Model	Default	Parameter valid range	When setting of valid range
VP208	A	A only	Command error will occur when setting outside of valid range.

[Print darkness level 2 range]

Model	Default	Parameter valid range	When setting of valid range
VP208	5	1,2,3,4,5,6,7,8,9,10 Light ⟶ Dark	Command error will occur when setting outside of valid range.

[Print darkness2 range]

Model	Default	Parameter valid range	When setting of valid range
VP208	A	A,B	Command error will occur when setting outside of valid range.

13.3 System

Available printer	China model	Thailand model	Vietnam model		

Media Size — ESC+A1

HEX code	ESC	A1	Parameter
	<1B>16	<41>16<31>16	aaaabbbb VaaaaaHbbbb
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Specifies media size.

[Format]
<A1>aaaabbbb (a, b fixed)
<A1>VaaaaaHbbbb (a, b variable)

●Parameter
a [Height of label] = Refer to the table below
b [Width of label] = Refer to the table below

[Valid Range]

Head density	Width of label (dots)	Height of label (dots)
8 dots/mm (203dpi)	1 to 8000	1 to 440

[Coding Example 1] Height of label：800 dots Width of label：400 dots
<A>
<A1>08000400
<Z>

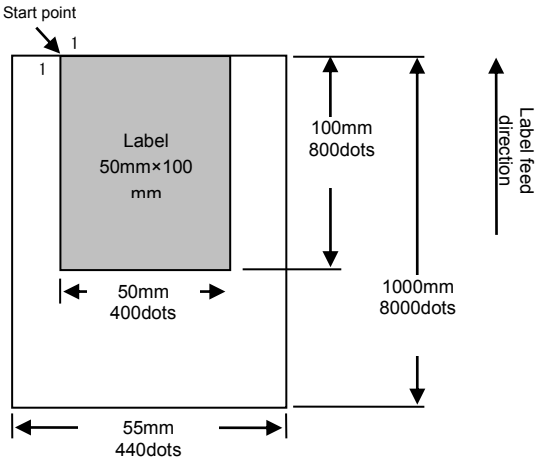
[Coding Example 2] Height of label：800 dots Width of label：400 dots
<A>
<A1>V800H400
<Z>

[Coding Example 3] Height of label：1200 dots Width of label：40 dots
<A>
<A1>12000040
<Z>

[Coding Example 4] Height of label：1200 dots Width of label：40 dots
<A>
<A1>V1200H40
<Z>

[Supplementary Explanation]

1. If using the label smaller than the head width, use this command for specifying the label size and adjust the start point position corresponding to the label size.
2. For specifying the label size, include the size of backing paper.



13.4 System

Available printer	China model	Thailand model	Vietnam model		

Base Reference Point Correction — ESC+A3

HEX code	ESC	A3	Parameter
	<1B>16	<41>16<33>16	VabbbHcddd
Initial value	a=+, b=000, c=+, d=000		

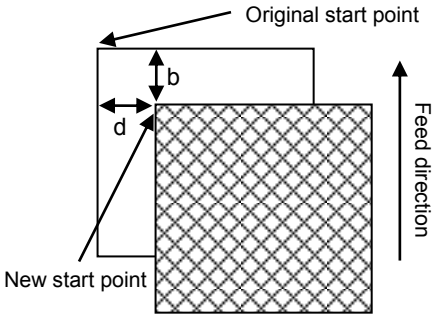
Valid range and term of command	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Changing the start point coordinate in Print setting mode of the printer (normaly).

[Format]
<A3>VabbbHcddd
●Parameter

a	[Vertical start point correction sign]	=	+, -
b	[Vertical start point correction (No. of dots)]	=	Refer to the table below
c	[Horizontal start point correction sign]	=	+, -
d	[Horizontal start point correction (No. of dots)]	=	Refer to the table below

[Coding Example]
<A>
<A3>V10H10
<Z>



[Supplementary Explanation]
1. If changing start point correction and being located outside of printable area, printing may not be performed.
2. When changing start point correction through multiple label formats, correction will affect all of the formats.

[Note]
1. This command is effective prior to the Print setting mode settings of printer LCD.
2. The value specified by this command will not be stored at Print setting mode of printer LCD. It will be valid until the value is changed or the printer is turned off.
3. The value specified by this command will be stored at Advaced mode of the printer. It will be maintained if the printer is turned off.

[Valid range]

Head density	Horizontal start point correction (dots)	Vertical start point correction (dots)
8 dots/mm (203dpi)	0 to 439	0 to 999

13.5 System

Available printer	China model	Thailand model	Vietnam model		

Memory Clear

ESC+*

HEX code	ESC	*	Parameter
	<1B>16	<2A>16	a[bbb･･･b]
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Clears print jobs and specific item in memory

[Format]

<*>a[,bbb･･･b]

●Parameter

a Item to be cleared=Not specified : Single item buffer, Receive buffer, Edit buffer (reprint is not possible)
Multi item buffer, Receive buffer, Edit buffer (Clears job in parsing)
T : reserved
& : reserved
X : All clear
(Receive buffer, Edit buffer)
Note the job, which is currently in progress, will not be cleared

[Coding Example1] Clear receive and edit buffer

<A>
<*>
<Z>

[Coding Example2] All clear

<A>
<*>X
<Z>

[Coding Example3] Clear user-defined characters

<A>
<*>T
<Z>

[Supplementary Explanation]

1. Set this command between Start code<A> and Stop code<Z>.
2. This command<*>(a=X) will clear all the data sent before the command. However, the data which is completely parsed before the command will not be cleared.

[Notes]

1. After the command <*> is executed, have an interval of more than 100ms before sending next print data.
2. The job in printing will not be terminated by the command <*>.

13.6 System

Available printer	China model	Thailand model	Vietnam model		

Register Printer Operation — ESC+PG

HEX code	ESC	PG	Parameter
	<1B>16	<50>16<47>16	abcdefghhijklmnooppqqrrstuvwwxy
Initial value	Refer to the table below.		

Valid range and term of command	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Registers printer settings

[Format]

<PG>abcdefghhijklmnooppqqrrstuvwwxy

●Parameter

See the table in next page for more details.

[Coding Example]

<A>

<PG><01 00 02 01 00 00 00 41 05 00 01 04 00 00 01 05 00 01 B8 00 00 00 00 0A 00 00 00 00 00 01 18>16

<Z>

Parameter shall be given in HEX <00H>16<00H>16<02H>16・・・・・・<00H>16

[Supplementary Explanation]

1. This command is not necessary to be specified in normal use.
2. The settings by this command will persist after turning off the printer.
3. Do not use this command while printing as sensor may not work properly.
4. If there is an invalid parameter included, command error will occur and the parameter will not be saved.

[Notes]

1. You can use Setting mode on Printer LCD to set parameters.

NO	Item	Description
a	Print method	00H: Not in use 01H: Direct thermal (Fixed)
b	Reserved	00H: Fixed 01H: Not in use
c	Print speed	00H: Not in use 01H: Not in use 02H: 4 (inches/sec) 100 (mm/s) (Initial value) 03H: 5 (inches/sec) 125 (mm/s) 04H: 5.6 (inches/sec) 140 (mm/s) 05H: Not in use 06H: Not in use
d	Print mode	00H: Continuous 01H: Tear-off 02H: Not in use 03H: Not in use 04H: Not in use
e	Not in use	00H: Fixed
f	Not in use	00H: Fixed
g	Not in use	00H: Fixed
h	Print darkness	41H: A (Initial value) 42H: B (Not in use) 43H: C (Not in use) 44H: D (Not in use) 45H: E (Not in use) 46H: F (Not in use)
h	Darkness level	01H: Level 1 02H: Level 2 03H: Level 3 04H: Level 4 05H: Level 5 (Initial value) 06H: Level 6 07H: Level 7 08H: Level 8 09H: Level 9 0AH: Level 10
i	Sensor type	00H: Reflective sensor (Initial value) 01H: Not in use 02H: Sensor disabled
j	0 slash	00H: Disabled 01H: Enabled (Initial value)
k	Kanji code	00H: Fixed 04H: GB18030 * 04H: Fixed for China model, 00H Fixed for others.
l	Reserved	00H: Fixed
m	Initial feed	00H: Disabled (Initial value) 01H: Enabled
n	Proportional pitch	00H: Disabled 01H: Enabled (Initial value)
o	Vertical label size (dots)	[0001H ~1F40H] (1~8000) (Initial value: 1280)
p	Horizontal label size (dots)	[0001H ~ 01B8H] (1~440) (Initial value: 440)
q	Vertical offset (dots)	[0000H ~ 0500H] (0 ~ 1280) (Initial value: 0) [FFFFH ~ FB00H] (-1~- 1280)
r	Horizontal offset (dots)	[0000H – 01B7H] (0 ~ 439) (Initial value: 0) [FFFFH – FE49H] (-1~ -439)
s	Option standby time (unit: 100 ms)	[05H - C8H] (5 ~ 200) (Initial value: 10)
t	Reserved	00H: Fixed
u	Media pitch offset (dots)	[00H -1EH] (0 ~ 30) (Initial value:0) [FFH –E2H] (-1 ~ -30)
v	Tear-Off offset (dots)	[00H ~1EH] (0 ~ 30) (Initial value:0) [FFH~E2H] (-1 ~ -30)
w	Auto power off time (minute)	[0000H~03E7H] (0 ~ 999) (Initial value:0)
x	Buzzer sound	00H: Off 01H: ON (Initial value)
y	Gap between labels	[00H ~40H] (0 ~64) Initial value：18H (24)

Refer to the Operation specifications for the information of Initial value.

13.7 System

Available printer	China model	Thailand model	Vietnam model		

Register Printer Operation — ESC+PC

HEX code	ESC	PC	Parameter
	<1B>16	<50>16<43>16	1）「a, b, c, d, ・・・x,yy」、2）「aa, b」
Initial value	Refer to the table below		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Registers printer settings

[Format 1]When all settings are newly registered
<PC>a,b,c,d,e,f,g,h1,h2,i,j,k,l,m,n,oooo,ppp,qqqqq,rrrr,sss,t,uuu,vvv,www,x,yy
●Parameter
a [Item No.] = F : All items
b ・・・ yy [Setting details] = See the table in next page for more details

[Format 2] When specific item are needed to be registered
<PC>aa,b
●Parameter
aa [Item No.] = 1 - 26
b [Setting details] = See the table in next page for more details

[Coding Example 1] all items
<A>
<PC>F,,,2,,,,,A,4,,1,0,,1,1,3000,400,,,,,,,,1
<Z>

[Coding Example 2] specific item
<A>
<PC>26,1
<Z>

[Supplementary Explanation]
1. The set parameter with this command wil be maintained after turning off the printer.
2. The entire or partial parameter entities is omissible by using commas. However, commas are not omissible. The parameters skipped by comma will not be changed.

NO	Item	Description
1	Print method	0: Reserved 1: Direct Thermal
2	Reserved	0: Fixed
3	Print speed	0: Reserved 1: Reserved 2: 4 (inches/sec) 100 (mm/s) 3: 5 (inches/sec) 125 (mm/s) 4: 5.6 (inches/sec) 140 (mm/s) 5: Reserved 6: Reserved
4	Print mode	0: Continuous 1: Tear-off (Initial value) 2: Reserved 3: Reserved 4: Reserved
5	Reserved	0: Fixed
6	Reserved	0: Fixed
7	Reserved	0: Fixed
8	Print darkness	A: A (Initial value) B: Reserved C: Reserved D: Reserved E: Reserved F: Reserved
9	Darkness level	1: Level 1 2: Level 2 3: Level 3 4: Level 4 5: Level 5 (Initial value) 6: Level 6 7: Level 7 8: Level 8 9: Level 9 10: Level 10
10	Sensor type	0: Reflective sensor (Initial value) 1: Reserved 2: Disabled
11	0 slash	0: Disabled 1: Enabled (Initial value)
12	Kanji code	0: Fixed 4 : GB18030 * 04H Fixed for China model, 00H Fixed for others.
13	Reserved	0: Fixed
14	Initial feed	0: Disabled (Initial value) 1: Enabled
15	Proportional pitch	0: Disabled 1: Enabled (Initial value)
16	Vertical label size (dots)	1 ~ 8000 (Initial value: 1280)
17	Horizontal label size (dots)	1 ~ 440 (Initial value: 440)
18	Vertical offset (dots)	-1280 ~ 1280 (Initial value: 0)
19	Horizontal offset (dots)	-439 ~ 439 (Initial value: 0)
20	Option waiting time (unit: 100 ms)	5 to 200 (Initial value: 10)
21	Reserved	0: Fixed
22	Media pitch offset (dots)	-30 ~ 30 (Initial value: 0)
23	Tear-Off offset (dots)	-30 ~ 30 (Initial value: 0)
24	Auto power off time (minute)	0 ~ 999 (Initial value: 0)
25	Buzzer sound	0: Off 1: On (Initial value)
26	Gap between labels	0～64 (Initial value：24)

13.8 System

Available printer	China model	Thailand model	Vietnam model		

Auto line feed	ESC+E

HEX code	ESC	E	Parameter
	<1B>16	<45>16	aaa
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies amount of line spacing and CR (Line feed)

[Format]

<E>aaa

●Parameter

a [line spacing] = valid rang : 0 to 999 dots

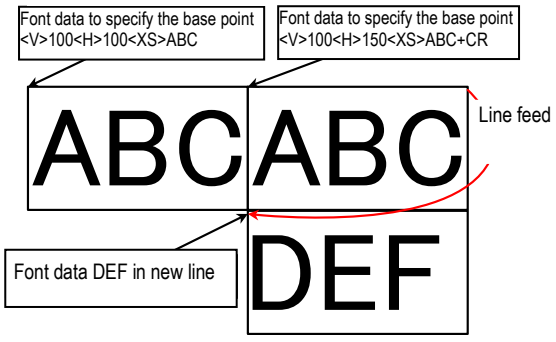
[Coding Example]

<A>
<E>10
<V>100<H>200<P>2<L>0304<XS>ABCDE+CR
FGHIJ+CR
<Q>2
<Z>

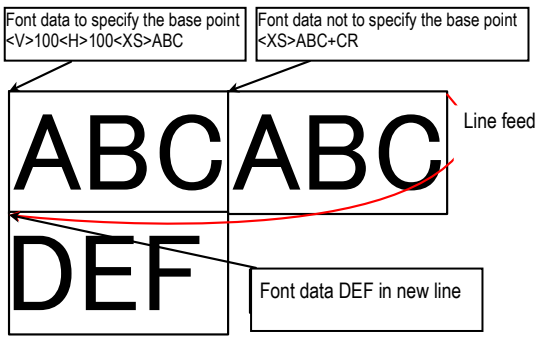
[Supplementary Explanation]

1. When CR (0DH) is specified, linefeed based on line pitch will be performed.
2. Rotation command <%> can be used in combination with this command.
3. The command <E> may be used in a job and change the line spacing as necessary.
4. Specify this command before designating the consecutive print of 1-line.
5. Performing auto linefeed by the designation of CR(0DH), print start position of linefeed will be determined based on the pitch specified with <E> and the value specified with Horizontal Print Position <H> designated after <E>.
   In case that <H> is specified several times after <E>, return position by CR (0DH) will be at the end of <H>.

Print Sample
<A><E>0
<V>100<H>100
<XS>ABC
<V>100<H>150
<XS>ABC+CR
DEF
<Z>



Print Sample
<A><E>0
<V>100<H>100
<XS>ABC
<XS>ABC+CR
DEF
<Z>



13.9 System

Available printer	China model	Thailand model	Vietnam model		

Delete paring information

ESC+I0

Hexadecimal code	ESC	I0	Parameter
	<1B>16	<42>16<30>16	abcdefghij
Initial value	abcdefghij=0000000000		

Valid range and term of command	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Deletes Bluetooth paring information.

[Format]

<I0>abcdefghij

●Parameter

a	"Paring information 1"	=	1	:	Delete
			0	:	Don't delete
b	"Paring information 2"	=	1	:	Delete
			0	:	Don't delete
c	"Paring information 3"	=	1	:	Delete
			0	:	Don't delete
d	"Paring information 4"	=	1	:	Delete
			0	:	Don't delete
e	"Paring information 5"	=	1	:	Delete
			0	:	Don't delete
f	"Paring information 6"	=	1	:	Delete
			0	:	Don't delete
g	"Paring information 7"	=	1	:	Delete
			0	:	Don't delete
h	"Paring information 8"	=	1	:	Delete
			0	:	Don't delete
i	"Paring information 9"	=	1	:	Delete
			0	:	Don't delete
j	"Paring information 10"	=	1	:	Delete
			0	:	Don't delete

[Coding Example] Deleting paring information 3 and 4:

<A>

<u><I0>0011000000</u>

<Z>

[Additional explanation]

1. This command is valid only for Bluetooth interface.
2. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
3. This command cannot be used in combination with other commands.
4. This command will be effective after rebooting.
5. The pairing information will be sorted after it is deleted.

[E.g.] It will be sorted in the following manner if paring information 3 and 4 are deleted from pairing information 1 through 10:

Pairing information 1	Device A		Device A	Pairing information 1
Pairing information 2	Device B		Device B	Pairing information 2
Pairing information 3	Device C		Device E	Pairing information 3
Pairing information 4	Device D		Device F	Pairing information 4
Pairing information 5	Device E		Device G	Pairing information 5
Pairing information 6	Device F		Device H	Pairing information 6
Pairing information 7	Device G		Device I	Pairing information 7
Pairing information 8	Device H		Device J	Pairing information 8
Pairing information 9	Device I		Free	Pairing information 9
Pairing information 10	Device J		Free	Pairing information 10

13.10 System

Available printer	China model	Thailand model	Vietnam model		

Specify time for Bluetooth power save mode

ESC+IL

Hexadecimal code	ESC	IL	Parameter
	<1B>16	<42>16<4C>16	aa
Initial value	aa=00		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Sets the time to switch to Bluetooth power save mode.

[Format]

<IL>aa

●Parameter

aa "Power save mode" = valid range: 00 to 60(Unit : Seconds)
The feature will be disabled when set to 00

[Coding Example] Setting power save mode time to 20 seconds:

<A>
<IL>20
<Z>

[Coding Example] Disabling power save mode:

<A>
<IL>00
<Z>

[Additional explanation]

1. The power saving mode is the mode to save the power consumption of the Bluetooth module.
2. The Bluetooth module will not switch to power save mode if the power save mode is disabled.
3. The Bluetooth module will switch to power save mode if power save mode is disabled and when there is no communication between the master for a certain amount of time(the time specified in this command).
4. This command is effective only for Bluetooth interface.
5. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
6. This command cannot be used together with other commands.
7. This command will be effective after rebooting.
8. The Bluetooth power save mode uses Sniff mode.

13.11 System

Available printer	China model	Thailand model	Vietnam model		

Disconnection timeout settings at power off

ESC+IE

Hexadecimal code	ESC	IE	Parameter
	<1B>16	<42>16<45>16	aa, bbb
Initial value	aa=10, bbb=100		

Valid range and term of command	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Sets the timeout time when disconnecting Bluetooth from the master at power off.

[Format]

<IE>a,b

●Parameter

aa "SPP layer timeout time" = Valid range: 01 to 10(Unit : Seconds)

bb "LMP layer timeout time" = Valid range: 001 to 999(Unit : 100ms)

[Coding Example] Setting SPP layer timeout time to 10 seconds and LMP layer timeout time to 0.5 seconds

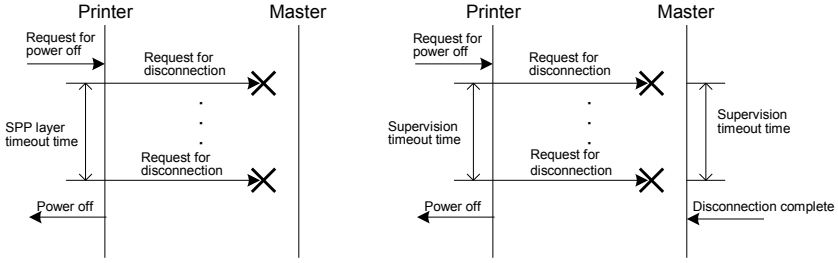
<A>

<IE>10,005

<Z>

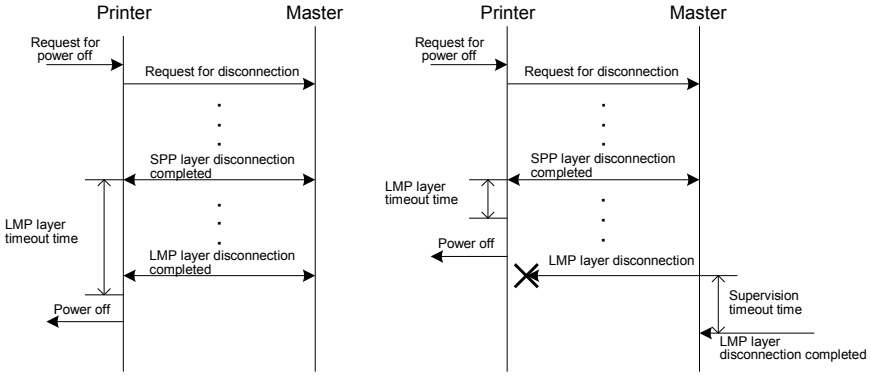
[Additional explanation]

1. SPP layer timeout time is used when the printer doesn't use supervision timeout. The power will be turned off when the SPP layer timeout time has passed, judging that the disconnection is completed.
   Restart for the following case of (a), as the master may not have been disconnected .



(a) Without supervision timeout (b) With supervision timeout

2. LMP layer timeout time is the waiting time from SPP layer disconnection to LMP layer disconnection. The waiting time shall be set on the printer side since the time between SPP layer disconnection to LMP layer disconnection depends on the connected device. The power will be turned off when the LMP layer timeout time has passed, judging that the disconnection is completed.



(a) If the LMP layer timeout time exceeds disconnection time

(b) If the LMP layer timeout time does not exceed disconnection time

3. This command is effective only for Bluetooth interface.
4. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
5. This command cannot be used together with other commands.
6. This command will be effective after rebooting.

13.12 System

Available printer	China model	Thailand model	Vietnam model		

Codepage

ESC+CE

Hex code	ESC	CE	Parameter
	<1B>16	<4316<45>16	a(,b)
Default setting	See table in next page		

Valid range and term of command	When power switch is OFF	Set parameter will be retained depending on the save settings
	Valid range within items	Retained until next valid setting
	Valid range between items	Retained until next valid setting

[Function]

Sets printer character encoding to be used in bitmap font printing.

[Format]

<CE>a(,P)

●Parameter

a [Character Encoding] = See table below.

(,P) Save Settings = Setting is permanent. (Notes 1)

[Coding Example]

- This code sets the printer character encoding to Windows Greek (1253) temporarily.

<A>

<CE>1253

<Z>

[Coding Example]

- This code sets the printer character encoding to Windows Greek (1253) permanently.

<A>

<CE>1253,P

<Z>

[Notes]

1. The character encoding will not be saved with the absence of ",P" parameter.
2. The current character encoding will be reflected in the factory test page.

Character Encoding(a)	Description
858	Multilingual Latin 1 + Euro character SATO Default Codepage
850	PC Multilingual
88591	ISO 8859/1 Latin 1
88592	ISO 8859/2 Latin 2
88599	ISO 8859/9 Latin 5
1250	Windows Central Europe
1251	Windows Cyrillic
1252	Windows Western Latin 1
1253	Windows Greek
1254	Windows Turkish
1257	Windows Baltic
857	DOS Turkish
852	DOS Central European
855	DOS Cyrillic
866	DOS Cyrillic II
869	IBM Greek
737	DOS Greek
UTF-8	UTF-8 Encoding

13.13 System

Available printer	China model	Thailand model	Vietnam model		

Option Standby Time — ESC+TW

HEX code	ESC	TW	Parameter
	<1B>16	<54>16<57>16	aaa
Initial value	aaa = 010 (1000ms)		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifies standby time for optional device

[Format]

<TW>aaa

●Parameter

aaa [Standby time] = Valid range: 005 to 200 (Unit : 100ms)

[Coding Example] (Standby time = 1.5 seconds)

<A>

<u><TW>015</u>

<Z>

[Supplementary Explanation]

1. This command specifies, in Tear-off mode, the waiting time between print completion and Tear-off motion.
2. The set parameter becomes valid soon after receiving the command and will be retained after power off.
3. Forced Tear-off motion is cancelled when turning off the power of printer while waiting for Forced Tear Off motion or a piece of paper is fed with [Feeding/Set] key.

13.14 System

Available printer	China model	Thailand model	Vietnam model		

Forced Tear Off

ESC+TK

HEX code	ESC	TK	Parameter
	<1B>16	<54>16<4B>16	Nil
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Executes Tear-off compulsory

[Format]

<TK>

[Coding Example]

<A>
<u><TK></u>
<Z>

[Supplementary Explanation]

1. This command can be specified only in Tear off mode.
2. With this command, the printer executes Tear off motion without waiting the time set by command <TW>. If the next data is received before Tear off motion, Tear off is executed compulsory.
3. This command can not be used in combination with other commands.

[Notes]

1. This command can be used to save the time set by command <TW>, if it is sure that there is no following item.

13.15 System

Available printer	China model	Thailand model	Vietnam model		

Buzzer setting

ESC+BU

Hexadecimal code	ESC	BU	Parameter
	<1B>16	<42>16<55>16	a
Initial value	a = 1		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Sets the availability of buzzer.

[Format]
<BU>a
●Parameter
a "Buzzer availability" = 0 : Disabled
1 : Enabled

[Coding Example]
<A>
<BU>1
<Z>

[Additional explanation]
1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
2. This command cannot be used together with other commands.
3. The settings can be confirmed in the test printing.

13.16 System

Available printer	China model	Thailand model	Vietnam model		

System priority settings

ESC+QS

Hexadecimal code	ESC	QS	Parameter
	<1B>16	<51>16<53>16	a
Initial value	a = 0		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Specifies system priority settings.

[Format]

<QS>a

●Parameter

a "System priority setup" = 0 : Disabled(prioritize command)

1 : Enabled(prioritize system settings)

[Coding Example]

<A>

<QS>1

<Z>

[Additional explanation]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
2. This command cannot be used together with other commands.
3. The settings can be confirmed in the test printing.
4. The following are the items which you can specify the system priority setting.

Setting	Target command
Print darkness/range	<#F>
Print speed	<CS>
Offset(start point correction) (vertical/horizontal)	<A3>
Sensor type	<IG>

13.17 System

Available printer	China model	Thailand model	Vietnam model		

Reprint on error

ESC+NR

Hexadecimal code	ESC	NR	Parameter
	<1B>16	<4E>16<52>16	a
Initial value	a = 0		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Selects whether to enable/disable reprinting the print job being printed when an error(paper end, cover open, sensor error due to paper jam) occurs while printing.

[Format]

<NR>a

●Parameter

a "Specify reprint" = 0 : Enable reprint
1 : Disable reprint

[Coding Example]

<A>
<NR>1
<Z>

[Additional explanation]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
2. This command cannot be used together with other commands.
3. The settings can be confirmed in the test printing.

14 Memory（FROM）Command

14.1 Memory

Available printer	China model	Thailand model	Vietnam model		

Specify user area	ESC+CC

Hexadecimal code	ESC	CC	Parameter
	<1B>16	<43>16<43>16	a
Initial value	a=1		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]
Specifying the slot number for use. (Slot number is fixed to 1)

[Format]
<CC>a
●Parameter
a [Slot number] = 1 : FROM：User area(fixed)

[Coding Example]
<A>
<CC>1
<GI>H003003001FF000000～000000FF
<Z>

[Supplementary Explanation]
1. Must specify it to access to FROM user area (hereinafter called Memory)

[Note]
1. Do not turn off the printer while accessing to memory. It is not guaranteed that data is saved if printer is off while accesing to memory.
2. Command error occurs if memory command is used without specifying <CC> after starting a printer.

14.2 Memory

Available printer	China model	Thailand model	Vietnam model		

Memory Initilalization — ESC+FM

Hexadecimal code	ESC	FM	Parameter
	<1B>16	<46>16<4D>16	aaaaaaaa
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the format (initialization) of memory card.

[Format]

<FM>aaaaaaaa

●Parameter

a [User ID] = Specifying up to 8 bytes in alphanumeric and symbols

[Coding Example]

<A>
<CC>1
<u><FM>sato</u>
<Z>

[Supplementary Explanation]

1. Specify 1 to slot number 1 to be used in Card Slot for Use <CC> before <FM>.
2. The command <FM> is used for formatting memory and can not be used with other commands.
3. Caution is demanded. If memory is formatted by mistake, we cannot guarantee on the deleted data.
4. Initialization takes time, but do not issue command before completion of initialization.
5. When data is formatted by specifying 1 for slot number to be used in Card Slot for Use <CC>, it deletes the contetns of FROM.
6. Command error occurs if other number is used for slot number to be used in Card Slot for Use <CC>.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

14.3 Memory

Available printer	China model	Thailand model	Vietnam model		

Memory Status Print

ESC+FP

Hexadecimal code	ESC	FP	Parameter
	<1B>16	<46>16<50>16	Nil
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Printing status of memory.

[Format]
<FP>

[Coding Example]
<A>
<CC>1
<u><FP></u>
<Z>

[Supplementary Explanation]

1. Be sure to specify the slot number used for the Card Slot for Use <CC> before <FP>.
2. This command is for printing status of memory card; therefore, it cannot be used in combination with other commands.
3. Status can be checked with the label of 55mm width and 56mm length.

[Note]
Don't power off while accessing the memory.

14.4 Memory

Available printer	China model	Thailand model	Vietnam model		

Form Overlay Registration — ESC+&S

Hexadecimal code	ESC	&S	Parameter
	<1B>16	<26>16<53>16	,aa(,bbbb,ccccc)
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The registered data is valid until the next specification is made.
	Valid range between items	The registered data is valid until the next specification is made.

[Function]

Specifying the registration of fixed print contents to a memory card.

[Format]

<&S>,aa(,bbbb,ccccc)

●Parameter

a	[Registration No.]	=	Valid range:	1 to 99
b	[Size specification of window width]	=	Valid range:	Refer to the table below (Omissible)
c	[Size specification of window height]	=	Valid range:	Refer to the table below (Omissible)

[Coding Example]

```
<A>
<V>100<H>100<XS>MODEL
<CC>1
<&S>,1
<Z>
```

[Supplementary Explanation]

1. Specify 1 to slot number to be used in Card Slot for Use <CC> before <&s>
2. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> for one format to be registerd.
3. The number will not be registeded if the same number has already been registered.
4. Able to register data on commands <G> and <GM>.
5. The maximum registration of <&S> is 99 fields, but it depends on memory.
6. Data being registered with <&S> can be cleared by<*>R
7. Except when the size of window is specified, information on the range of barcode check is stored when registering form overlay and is added as the range of headcheck after calling form overlay if range of head check is set to barcode (This specification is not open to users)

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

[Valid Range]

Head density	Valid Range (dot)	
	Horizontal size of the window	Vertical size of the window
8dot/mm (203dpi)	440	8000

[Valid Command]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	
	<BP>	<BL>	<BL><d>	<BM>						
2D code	<2D10>	<2D12>	<2D20>	<2D30>	<2D31>	<2D32>	<2D33>	<2D50>	<2D51>	
Modification	<FW>	<(>								
Graphic	<G>	<GM>								

*1 Only available for China model

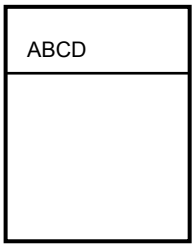
In general, this command is used for [Registration number] only. Specification of window height and width will control the movement with Vertical Print Position <V> and Horizontal Print Position <H> at the time of calling. For the movement at the time of calling, if registered area is exceeding print area, the portion outside of print area will not be printed.

The following are the brief operation.

(1) Normal(To register)

```
<A>
<V>100<H>100<P>2<L>0202
<XB>0ABCD
<V>60<H>60
<FW>0808V800H400
<V>320<H>60
<FW>04H400
<CC>1
<&S>,1
<Z>
```

Registered image



(2) When print is specified after the command <&S>

```
<A>
<V>100<H>100<P>2<L>0202
<XB>0ABCD
<V>60<H>60
<FW>0808V800H400
<V>320<H>60
<FW>04H400
<CC>1
<&S>,1
<V>200<H>100<OB>12345
<Z>
```

Anything specified prior to the command <&S> will be registered as form overlay.

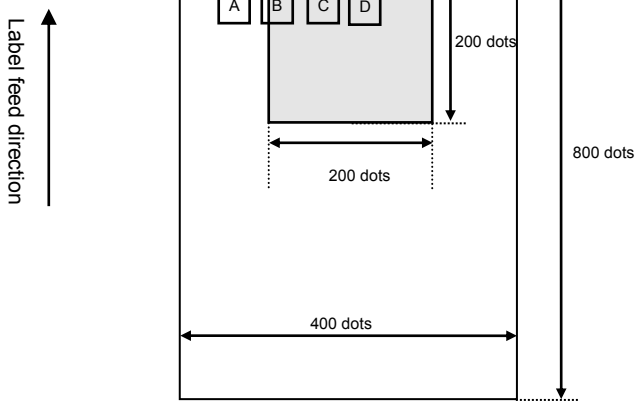
← Printing out this part

(3) When window size is specified

Label Size <A1>08000400, Window width [200], Window height[200]

```
<A>
<A1>08000400
<V>100<H>00<P>2<L>0202
<XB>0ABCD
<CC>1
<&S>,1,200,200
<Z>
```

Registering this shadowed area only.



14.5 Memory

Available printer	China model	Thailand model	Vietnam model		

Form Overlay Call

ESC+&R

Hexadecimal code	ESC	&R	Parameter
	<1B>16	<26>16<52>16	,aa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking the contents in memory card with Registration of Form Overlay <&S>.

[Format]

<&R>,aa

●Parameter

a [Registration Number] = Valid Range : 1 to 99

[Coding Example]

<A>
<CC>1
<&R>,1
<Z>

[Supplementary Explanation]

1. Specify slot number of Card Slot for Use <CC> prior to this command when using.
2. This command can be combined with different registration No. and printed.
3. When registration No. is not specified, this command will be ignored.
4. If specifying unregistered No., Read/Write error will occur.
5. When registering without specifying window, Vertical Print Position <V> and Horizontal Print Position <H> will be ignored and V1 and H1 (Start position of drawing area) will be determined.
6. When specifying and registering window, movement with <V> and <H> will be enabled.
   Note that when exceeding print area, the portion outside of print area will not be printed.
7. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

[Valid Command]

Print position	<V>	<H>								

14.6 Memory

Available printer	China model	Thailand model	Vietnam model		

Format Registration — ESC+YS

Hexadecimal code	ESC	YS	Parameter
	<1B>16	<59>16<53>16	,aaa
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Registering print format.

[Format]

<YS>,aaa

●Parameter

a [Format registration number] = Valid Range : 1 to 999

[Coding Example]

```
<A>
<CC>1
<YS>,1
</N>,3,3
<%>0<V>100<H>200<P>2<L>0101<XM>ABC
<Z>
```

[Supplementary Explanation]

1. When registering multiple formats, Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with one format.
2. Specify Card Slot for Use <CC> prior to this command when using.
3. Use this command and Registration of Field </N> as a pair.
4. Attempts to re-register with registered No., error will occur, and the targeted content will be printed.
5. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

1. Don't power off while accessing the memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The maximum registration with </N> is 99 fields. (Refer to the customizable print command of the field registration(ESC+/N) for the commands can be registered.)
3. The maximum registration with other than </N> is 50 fields. Refer to the customizable print command for the commands can be registered.)
4. The number of slot shall be 1 for use

[Point]

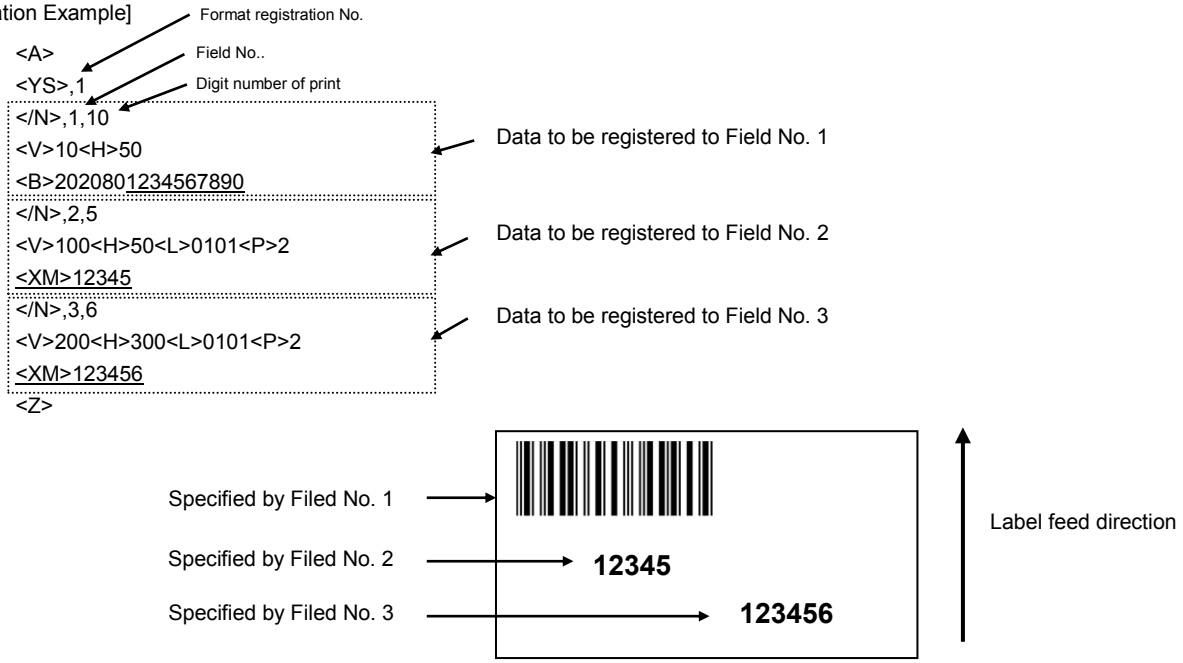
Details of Format Registration

A group of commands can be registered to a memory card (option). Once registered, it saves time to specify the identical command group. The registration also allows a change of print data when invoking the format. Such function is called “Format Registration”.
One item consists of different command groups necessary for printing, and such groups are called “Field”. Note that multiple fields make format.

Commands for format registration:

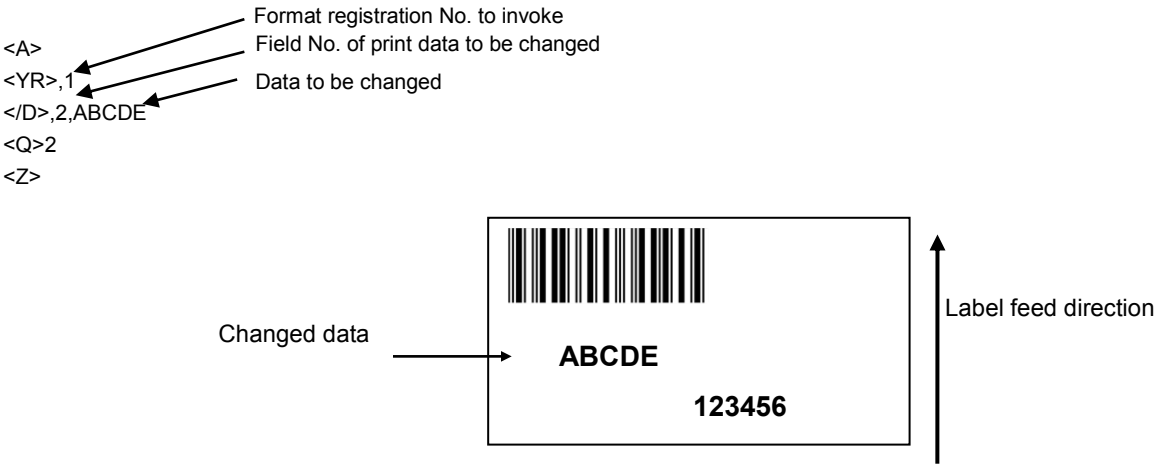
One format consists of a pair of commands from Start of Data Transmission <A> to End of Data Transmission <Z>, and specify Registration of Format <YS> right after <A>. For <YS>, specify [Format registration No.] between 1 and 999. And then, insert Registration of Field </N> after <YS> to specify [Field No.] and [Digit No. of print quantity].
After [Field No.] and [Digit No. of print quantity] are entered, specify print position, character type, barcode, and so on.

[Registration Example]



Invoking the registered print contents
Specify saved [Format registration No.] between 1 and 999 with Format Call <YR>.
To change print data, use Print of Field <D> to specify [Field No.] to be changed, and continuously specify the changed print data.
Note that the underlined parts in the [Registration Example] are changeable.

Calling Example



Available registration command is as follows.

[Valid Command]

Print positon	<V>	<H>								
Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	<BP>
Modification	<P>	<L>	<PS>	<PR>	<%>	<FW>	<(>			
System	<A1>	<A3>								
Memory	<&R>	</N>	<GR>	<GC>						

*1 Only available for China model

(Caution) The operation when registering a command other than available command is not guaranteed.

14.7 Memory

Available printer	China model	Thailand model	Vietnam model		

Registration of Field

ESC+/N

Hexadecimal code	ESC	/N	Parameter
	<1B>16	<2F>16<4E>16	,aa,bb
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Registering items within the field of Registration of Format <YS>.

[Format]

</N>,aa,bb

●Parameter

a [Field number] = Valid Range : 1 to 99

b [Digit number of print] = Valid Range : 1 to 99

[Coding Example]

<A>
<CC>1
<YS>,1
</N>,1,3
<%>0<V>100<H>200<P>2<L>0101<XM>ABC
</N>,2,5
<%>0<V>200<H>200<P>2<L>0101<OA>12345
</N>,3,8
<%>0<V>300<H>40<B>40208049123456
<Z>

[Supplementary Explanation]

1. Specify the value of [Field number] in ascending order.
2. Specify Vertical Print Position <V> and Horizontal Print Position <H> for each field. If not, default value will be set.
3. Specification of digit number when printing external character.
   External code H, one external character has 4 digits; thus, three external characters make 12 digits for printing.
   External code B, one external character has 2 digits; thus, three external characters make 6 digits for printing.
4. Use this command and Registration of Format <YS> as a pair.
5. Due to the memory capacity limit, it may not save up to 99 registries.
6. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]

1. Don't power off while accessing the memory.
2. The number of slot shall be 1 for use.

[Designable Commands for the Change of Print]

Font	<OA>	<OB>								
	<XU>	<XS>	<XM>	<XB>	<XL>					
	<K1>*1	<K2>*1	<K8>*1	<K9>*1	<k1>*1	<k2>*1	<k8>*1	<k9>*1		
	<C1>*1	<C2>*1	<C8>*1	<C9>*1	<c1>*1	<c2>*1	<c8>*1	<c9>*1		
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BI>	<BC>	<BG>	
	<BP>	<BL>								
Modification	<P>	<L>	<%>							

*1 Only available for China model

14.8 Memory

Available printer	China model	Thailand model	Vietnam model		

Format Call	ESC+YR

Hexadecimal code	ESC	YR	Parameter
	<1B>16	<59>16<52>16	,aaa
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Invoking and printing out the format registered with Registration of Format <YS>.

[Format]

<YR>,aaa

●Parameter

a [Format registration Number] = Valid Range : 1 to 999

[Coding Example]

```
<A>
<CC>1
<YR>,1
</D>,1,DEF
</D>,2,78901
</D>,3,49000238
<Q>2
<Z>
```

[Supplementary Explanation]

1. This command cannot invoke multiple formats between Start of Data Transmission <A> and End of Data Transmission <Z>.
2. Use this command and Print of Field </D> as a pair.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

14.9 Memory

Available printer	China model	Thailand model	Vietnam model		

Print of Field — ESC+/D

Hexadecimal code	ESC	/D	Parameter
	<1B>16	<2F>16<44>16	,aa,n～n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Invoking the items registered with Registration of Field and specifying data.

[Format]

</D>,aa,n~n

●Parameter

a [Field number] = Valid Range : 1 to 99

n [Data] = Data to be changed

[Coding Example]

<A>
<CC>1
<YR>,1
</D>,1,DEF
</D>,2,78901
</D>,3,49000238
<Q>2
<Z>

[Supplementary Explanation]

1. Digit number of print is valid within the range specified with Registration of Field </N>.
2. When digit number of this command is larger than the one specified with Registration of Field </N>, only the defined digit No. will be available for printing.
3. Use this command and Format Call <YR> as a pair.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

14.10 Memory

Available printer	China model	Thailand model	Vietnam model		

Registration of Graphic — ESC+GI

Hexadecimal code	ESC	GI	Parameter
	<1B>16	<47>16<49>16	abbbcccdddn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Specifying the registration of graphic pattern data.

[Format]
<GI>abbbcccdddn~n
●Parameter
a [Selection of data transfer in HEX or BIN] = H : Hex data
B : Binary data

Hex data (Divide 8 bits data into 4 bits and outputs it as hex code corresponding to ASCII)
Binary data (Output 8 bits data as one character data all at once)

b [Specification of crosswise graphic area per byte] = Refer to the table below
c [Specification of lengthwise graphic area per byte] = Refer to the table below
d [Registration number] (Identification number when invoking) = Valid range: 1 to 999
n [Data] = Graphic data

[Coding Example 1] [H: HEX data] is specified for [Data specification by HEX and BIN]
[□] is registered to the 999th of the slot 1 by the below.
<A>
<CC>1
<GI>H001001999<4646383138313831383138313831383146 46>16
<Z>

[Coding Example 2] [B: Binary data] is specified as Data specification by HEX and BIN]
[□] is registered to the 999th of the slot 1 by the below.
<A>
<CC>1
<GI>B001001999<FF818181818181FF>16
<Z>

[Supplementary Explanation]
1. Specify the card slot number used for Card Slot <CC> prior to this command.
2. Specify registered data only.
3. To change the registered content, clear it with Clear <*> to re-register.
4. Graphic Call <GR> is for printing out the data registered with Registration of Graphic <GI>.
5. When data is not registered properly, print error may occur. For details of data format, refer to Print of Graphic <G>.
6. Attempts to re-register with registered No., error will occur, and the targeted content will be printed.
7. The error occurs when specifying unused or specifying the slot which the printer is allocated.

[Note]
1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

[Specified Range]

Head density	Maximum byte in horizontal direction	Maximum byte in horizontal direction
8dot/mm (203dpi)	55	999

14.11 Memory

Available printer	China model	Thailand model	Vietnam model		

Graphic Call — ESC+GR

Hexadecimal code	ESC	GR	Parameter
	<1B>16	<47>16<52>16	aaa
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking and printing out the data registered with Registration of Graphic <GI>.

[Format]

<GR>aaa

●Parameter

a [Registration number] = Valid Range : 1 to 999

[Coding Example]

<A>
<V>100<H>100
<CC>1
<GR>1
<Q>1
<Z>

[Supplementary Explanation]

1. Specify Card Slot for Use <CC> prior to this command when using.
2. Ignoring Start Point Correction <A3> and making no correction.
3. Rotation <%> and Enlargement <L> are available for the invoked graphic.
4. The error occurs when unused or the slot which the printer is allocated is specified.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

14.12 Memory

Available printer	China model	Thailand model	Vietnam model		

BMP File Registration

ESC+GT

Hexadecimal code	ESC	GT	Parameter
	<1B>16	<47>16<54>16	aaa,bbbbb,n~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying the registration of BMP file created by such as Paint Brush of Windows.

[Format]

<GT>aaa,bbbbb,n~n

●Parameter

a [Registration number] = Valid Range : 1 to 999

b [Total bytes of BMP file] = Valid Range : 1 to 99999
Specify the file size of BMP file for total bytes.

n [Data] = BMP file data
Data is sent as binary data (Outputs 8 bits as one character data all at once)

[Coding Example]

<A>
<CC>1
<GT>1,12345,<424D00～00>16
<Z>

[Supplementary Explanation]

1. Specify Card Slot for use <CC> prior to <GT> command.
2. Data is sent as binary data (Outputs 8 bits as one character data all at once). In this case, file size of BMP file becomes the total bytes, and BMP file data becomes data.
3. Data up to 62 byets in BMP file indicates header and data in 62 bytes or more indicates image data.
4. When [Total bytes of BMP file] is not matching the transfer data, this may cause malfunction.
5. Total bytes are the file size displayed at [Property] and such.
6. BMP file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for BMP compressed file. Make sure that the file extension is set to [BMP] before printing.
7. Specify Card Slot for use<CC> prior to <GT> command for using <GT> command.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

14.13 Memory

Available printer	China model	Thailand model	Vietnam model		

BMP File Call

ESC+GC

Hexadecimal code	ESC	GC	Parameter
	<1B>16	<47>16<43>16	aaa
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Invoking and printing out the data registered with Registration of BMP File<GT>.

[Format]

<GC>aaa

●Parameter

a [Registration number] = Valid Range : 1 to 999

[Coding Example]

<A>
<V>100<H>100
<CC>1
<GC>1
<Q>2
<Z>

[Supplementary Explanation]

1. Rotation <%> and Enlargement <L> are available for the invoked data.
2. Specify Card Slot for Use <CC> prior to this command when using.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

14.14 Memory

Available printer	China model	Thailand model	Vietnam model		

Memory 16x16 dots External Font Registration	ESC+T1

Hexadecimal code	ESC	T1	Parameter
	<1B>16	<54>16<31>16	abbn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Registering 16x16 dots external fonts in the memory card.

[Format]

<T1>abbn~n

●Parameter

a	[Registration data selection]	=	H	:	HEX character
			B	:	Birnary code
b	[Registration font code address]	=	H	:	Up to 95 registrations from 21H to 7FH is available.
			B	:	Up to 95 registrations from “21” to “7F” is available.
n	[Registerd external font data]				

[Coding Example]

<A>
<CC>1
<u><T1>H2100FF00FF~3C0000FF</u>
<Z>

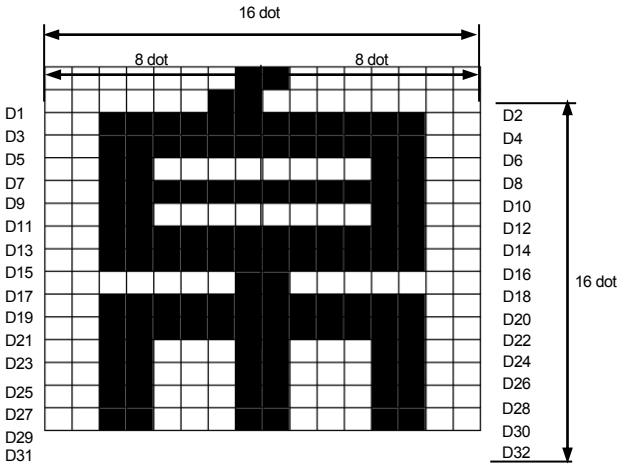
[Supplementary Explanation]

1. Overwriting registration data is available.
2. Specify slot registered with Card Slot for Use <CC> prior to this command<T1> by all means.
3. When use <T1> with another registration command, it may occur error because of capacity shortage of the memory card.In this case, register another command in onother memory card, or use a memory card having bigger capacity.

5. Data output is as follows.

External file [16x16]

D1	D2
D3	D4
D5	D6
|	|
D31	D32



When registering the external characters described above, D1 data becomes <01>16 and D2 data becomes <80>16 because D1 consists of [00000001], D2 consists of [10000000].

In the same manner, D3 is $<03>_{16}$, D4 is $<00>_{16}$, D5 is $<3F>_{16}$, D6 is $<FC>_{16}$, and the external registration data will be $<018003003FFC.....>_{16}$ up to D32.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use.

14.15 Memory

Available printer	China model	Thailand model	Vietnam model		

Memory Card 24x24 dots External Font Registration	ESC+T2

Hexadecimal code	ESC	T2	Parameter
	<1B>16	<54>16<32>16	abbn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Registering 24x24 dots external fonts in the memory card.

[Format]

<T2>abbn~n

●Parameter

a [Registration data selection] = H : HEX character
B : Binary code

b [Registration font code address] = H : Up to 95 registrations from 21H to 7FH is available.
B : Up to 95 registrations from “21” to “7F” is available.

n [Registered xxternal font data]

[Coding Example]

<A>
<CC>1
<u><T2>H2100FF00FF~3C0000FF</u>
<Q>2
<Z>

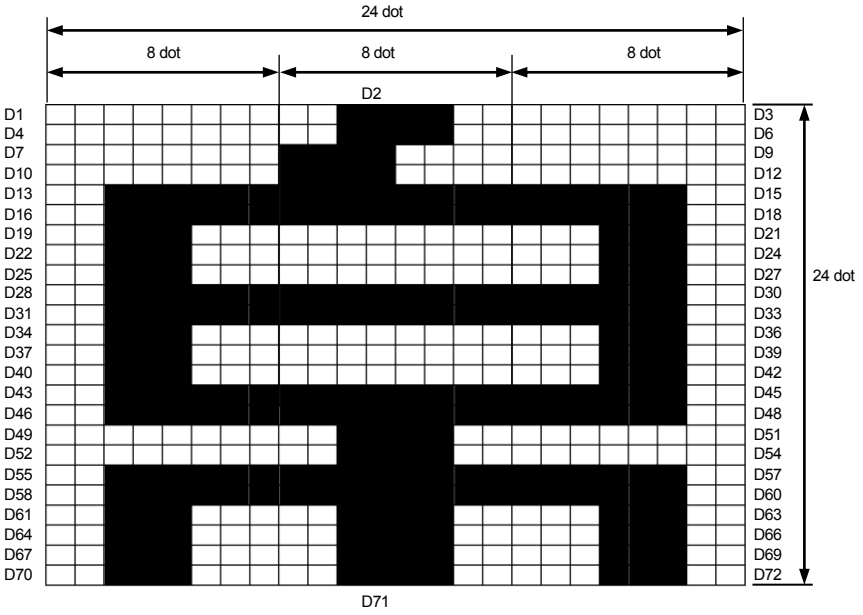
[Supplementary Explanation]

1. Overwriting registration data is available.
2. Specify slot registered with Card Slot for Use <CC> prior to this command<T2> by all means.
3. When use <T2> with other registration command, it may occur error because of capacity shortage of the memory card.
   In this case, register another command in onother memory card, or use a memory card having bigger capacity.

5. Data output is as follows.

External file [24x24]

D1	D2	D3
D4	D5	D6
D7	D8	D9
|	|	|
D70	D71	D72



When registering the external characters described above, D1 data becomes <00>$_{16}$, D2 data becomes <3C>$_{16}$ and D3 data becomes <00>$_{16}$ because D1 consists of [00000000], D2 consists of [00111100] and D3 consists of [00000000].
In the same manner, D4 becomes <00>$_{16}$, D5 becomes <3C>$_{16}$ and D6 becomes <00>$_{16}$, and the external registration data are specified to <003C00003C00…> and up to D72.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use.

14.16 Memory

Available printer	China model	Thailand model	Vietnam model		

Horizontal Writing External Font Call	ESC+K1(K2)

	ESC	K1(K2)	Parameter
Hexadecimal code	<1B>16	<4B>16<31>16(<4B>16<32>16) (<4B>16<38>16) (<4B>16<39>16)	abbn~n
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying call of external fonts registered in memory card.

[Format]

<K1>an~n

<K2>an~n

●Parameter

a [External font registration] = H : HEX character
B : Binary code
I : HEX character wih smoothing
C : Binary code with smoothing
J : HEX character wih highliting
D : Binary code with highlighting
K : HEX character with smoothing and highlitig
E : Binary code with smoothing and highlitig

n~n [Registration code] = H, I, J, K: “8021” to “807F”
B, C, D, E: 8021H to 807FH

[Coding Example]

```
<A>
<CC>1
<V>100<H>100
<K1>H9021
<Q>2
<Z>
```

[Supplementary Explanation]

1. Specify Card Slot for Use <CC> prior to this command<K1> <K2><K8><K9>.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use.

14.17 Memory

Available printer	China model	Thailand model	Vietnam model		

Vertical Writing External Font Call — ESC+k1(k2)

Hexadecimal code	ESC	k1(k2)	Parameter
	<1B>16	<6B>16<31>16(<6B>16<32>16) (<6B>16<38>16) (<6B>16<39>16)	abbn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]

Specifying call of external fonts registered in memory card.

[Format]

<k1>an~n

<k2>an~n

●Parameter

a [External font registration] = H : HEX character
B : Binary code
I : HEX character wih smoothing
C : Binary code with smoothing
J : HEX character wih highliting
D : Binary code with highlighting
K : HEX character with smoothing and highlitig
E : Binary code with smoothing and highlitig

n~n [Registration code] = H, I, J, K: “8021” to “807F”
B, C, D, E: 8021H to 807FH

[Coding Example]

```
<A>
<V>100<H>100
<RU>1
<k1>H9021
<Q>2
<Z>
```

[Supplementary Explanation]

1. Specify Card Slot for Use <CC> prior to this command<k1> <k2><k8><k9>.

[Note]

1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use.

14.18 Memory

Available printer	China model	Thailand model	Vietnam model		

Memory Clear	ESC+*

Hexadecimal code	ESC	*	Parameter
	<1B>16	<2A>16	a(,bbb)
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Clearing the entire contents in memory card (option).

[Format]
<*>a(,bbb)
●Parameter
a [Item to be cleared] = G: SATO Graphic
(Clearing graphic registered with Registration of Graphic <GI>)
M: BMP file
(Clearing BMP file registered with Registration of BMP File <GT>)
F: Format
(Clearing format registered with Registration of Format <YS>)
R: Form Overlay
(Clearing form overlay registered with Registration of Form Overlay <&S>)

b [Registration No.] = Valid range: 001 to 999 (Omissible)
(When omitting Registration No., all the registered data will be cleared.)

[Coding Example1] Clearing 001 of SATO graphic
<A>
<CC1>
<*>G,001
<Z>

[Coding Example2] Clearing Form Overlay entirely
<A>
<CC1>
<*>R
<Z>

[Supplementary Explanation]
1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command <*> for use.
2. Specify slot number of Card Slot for Use <CC> prior to this command<*> when using.

[Point]
1. To clear all data of memory card, use Format <FM>.

[Note]
1. Do not turn off the power while accessing to memory. It is not guaranteed that data is saved if power is off while accesing to memory.
2. The number of slot shall be 1 for use

15 Intelligent Command

15.1 Intelligent

Available printer	China model	Thailand model	Vietnam model		

Label Feed Control	ESC+IK

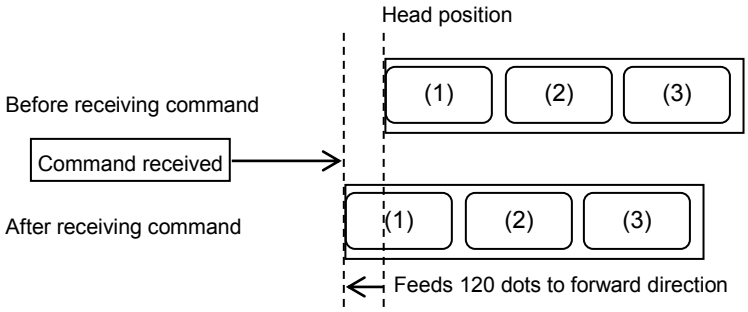
Hexadecimal code	ESC	IK	Parameter
	<1B>16	<49>16<4B>16	a(,bbbb)
Initial value	Nil		

Valid range and term of command		
	When power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter becomes invalid.
	Valid range between items	The set parameter becomes invalid.

[Function]
Feeding forward or backward for the specified number of labels.

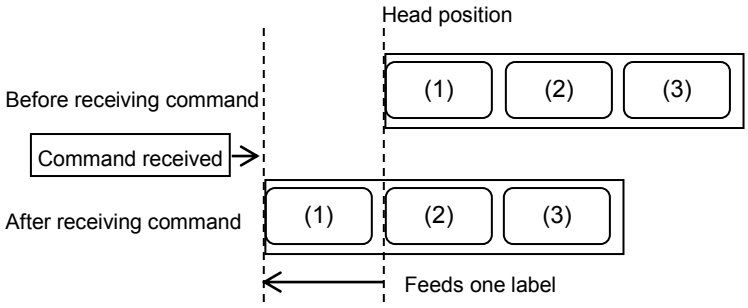
[Format]
<IK>a(,bbbb)
●Parameter
a [Feed direction] = 0 : Forward reed
1 : Backfeed
b [Number of lable feed] = Valid Range : Refer to the table in the next page (Omissible only for forward feed)
Feeds one label when omitting this parameter.

[Coding Example1]
<A>
<IK>0,120
<Z>



When print data is received without returning to the original position with <IK>1,120, printing will start from the current stop position.

[Coding Example2] When feeding one label
<A>
<IK>0
<Z>



[Supplementary Explanation]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command. When specifying this command with the same item as print data, the command will be ignored.
2.. When setting [Label feed direction] to [1: Backfeed], length of label feed needs to be checked. If this length is very long, it may cause overlapped prints or label may fall off the platen and result in detection error as paper-end.
3. Do not feed paper backward in Tear-off motion after tear-off.
4. When number of label feed is specified, the speed of feeding paper is 4inch/seconds.
5. When omitting [No. of label feed] in forward feed, printer motion will be similar to label feed motion when pressing the FEED key in offline state.
6. Label feed motion with this command will be activated at the time of online.
7. When omitting [No. of label feed] in backfeed, label feed will not be performed due to command error.
8. When the print start position is outside of printable area, printing will not be performed due to command error.
9. Actual feed distance may be different from the set value according to the individual difference of each printer, supplies and operating environment. Recommend to adjust the feed value before operation.

[Valid Range]

Head density	Media feed direction = Forward direction feed length (dot)	Media feed direction = Backward direction feed length (dot)
203 dpi	32 to 1600	32 to 77

15.2 Intelligent

Available printer	China model	Thailand model	Vietnam model		

Specify internal buzzer

ESC+IU

Hexadecimal code	ESC	IU	Parameter
	<1B>16	<49>16<55>16	a
Initial value	なし		

Valid range and term of command		
	When power switch is OFF	The set parameter is maintained.
	Valid range within items	The set parameter is valid until the next valid setting.
	Valid range between items	The set parameter is valid until the next valid setting.

[Function]

Sounds the printer's internal buzzer.

[Format]

<IU>a

●Parameter

a "Specify tone" = Valid range: 0-4

0 : One short sound
1 : One long sound
2 : Two continuous short sounds
3 : Two continuous long sounds
4 : Three continuous long sounds

[Coding Example] Make one short sound

<A>
<IU>0
<Z>

[Additional explanation]

1. A short sound lasts for 100ms, a long sound lasts for 500ms.
2. The interval between continuous sounds(tone 2, 3 and 4) are 5ms or more.
3. The printer stops analyzing the receive data while the buzzer is making the sound.
4. The timing for the buzzer to make the sound may be off from the currently printed item.
   To synchronize the buzzer sound with printing, obtain the printer status to send this command out.

Part 2 Interface Specification

1 Overview

1.1 Overview

The Mobile Printer VP208 printer has a built-in interface on the printer to communicate data with host.

Types of build-in interface are as follows.

1) Bluetooth interface（Ver.3.0+EDR Class 2 ）
2) USB interface (USB2.0 High-speed、Mini B type connector)

・・・[Available only when printer is configured]

1.2 Function settings

Function settings are required for each interface in communication setting mode of printer.

・ Procedures for changing mode I/F settings mode

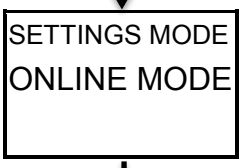
Following is the procedure for changing a mode to I/F settings mode to configure setting for each interface.

1. Turn on the power of printer. Press [Print/Select] key while printer is ready for printing. The printer enters OFFLINE mode.

[Print/Select]

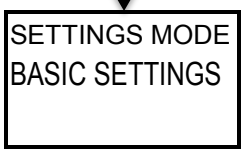
2. Press [Print/Select]+[Media Feed/Enter] keys for 3 seconds or more. ONLINE MODE screen appears.

[Print/Select]+[Media Feed/Enter] 3 seconds



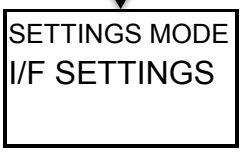
3. Press [Print/Select] key. BASIC SETTINGS screen appears.

[Print/Select]



4. Press [Print/Select] key. I/F SETTINGS screen appears.

[Print/Select]



5. Press [Media Feed/Enter] key. The printer enters I/F SETTINGS mode.

*Turn off the printer after setting, and then reboot the printer.

2 Communication protocol

2.1 Types of communication protocol and receive mode

The available receive mode is Multiple buffer, but communication protocol differs depending on interface.

- Multiple buffer mode
  Data receiving is available during print operation up to near full size.
- Status 3, Status 4
  Perform data communication by monitoring status of printer Status

Available communication protocols are shown below.

Interface / Communication protocol	Bluetooth	USB
Status 3 Multiple buffer With bidirectional communication	○	×
Status 4 Multiple buffer With bidirectional communication	○	○

[○ : Valid, × : Invalid]

2.2 Return Status

Return status is used to control the printer Status by the host, and the printer returns the status by request command from the host. There are two types of return status format, Satus3 and Status4. Each return status is listed below.
The printer returns the status after receiving request command.

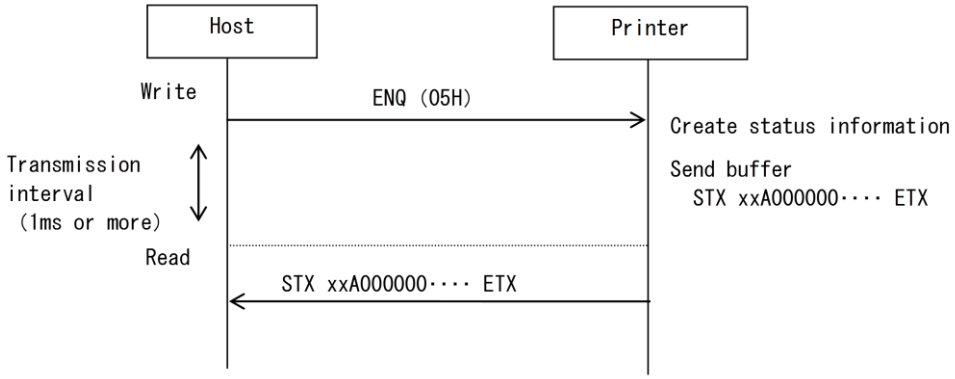
Communication protocol	Command	Command name	Remarks
Status 3	ENQ	Status request command	Exclude HEX dump mode
	CAN	CAN Cancel request command	
Status 4	ENQ	Status request command	Exclude HEX dump mode
	CAN	CAN Cancel request command	
	DLE	Print stop request command	
	DC1	Print start request command	
Status 3 Status 4	SOH + MG	Printer operation setup request command	
	SOH + SB	System version information request command	
	SOH + EB	Empty memory area information request command	
	SOH + HC	Head status information request command	
	SOH + ME	Pinter counter information request command	
	SOH + SG	Sensor level information request command	
	SOH + BI	Battery information request command	
	SOH + TW	Stand-by time request for options command	
	SOH + H6	Bluetooth interface information request command.	

Note: In Status3 and 4, command is processed for ESC+ENQ and ESC+CAN and returns status, but doesn't process command nor returns status for ESC+DLE and ESC+DC1.

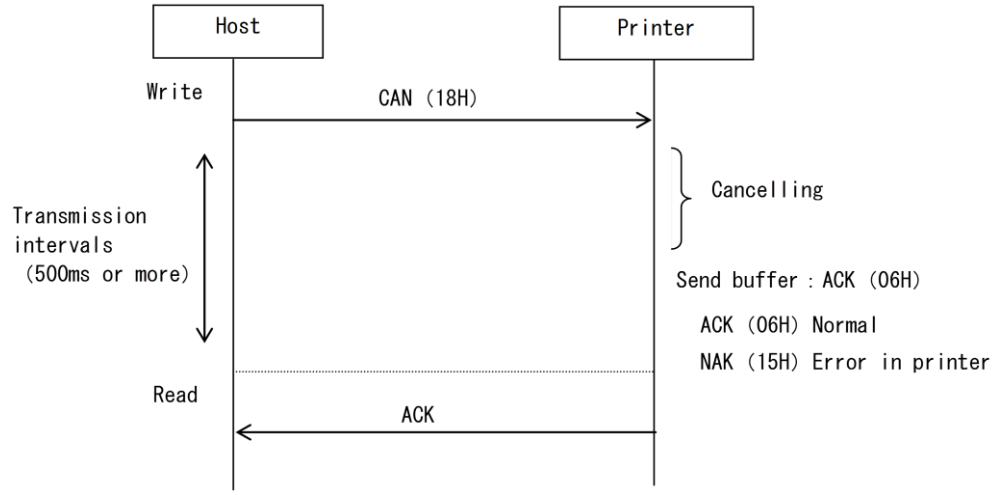
When you acquire return status from printer, input transmission interval time after sending each command to printer.

Command	Command name	Transmission interval time
ENQ（05H）	Status request command	1ms or more
CAN（18H）	Cancel request command	500ms or more
DLE（10H）	Print stop request command	
DC1（11H）	Print start request command	

(1)ENQ (Status request)



(2)CAN (Cancel request)



The above transmission intervals (500ms) are a rough standard to wait for Cancel request (18H) It varies by the interface type of printer.

* The rough standard for transmission interval shall be 900ms or more when you request cancel (18H) when receive buffer is near full.

2.2.1 Return status of Status 3

The purpose of this communication protocol is to return the printer condition and reply as a status to the host by receiving three types of request commands and print command.

Details of request commands and return status are described below.

1) Status request command

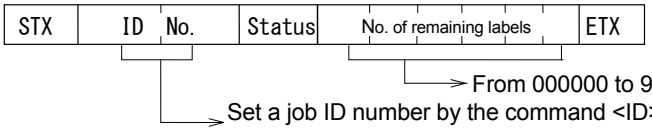
This command returns the job ID number of receive data in printing, the printer status, the number of remaining labels to print to the host. When the print is completed or when there is no receive data, print quantity returns all “0” (HEX 30H). If the command for the designation of job ID number is not specified, the ID number returns space (HEX 20H).

* Do not send ENQ (status request) while sending print data (STX <A> - <Z> ETX). If ENQ is sent, status would not be returned properly or printing would not be performed properly.

1. Command (HEX 05H)

   STX(HEX 02H)
   ETX(HEX 03H)

2. Return status format



(Total 11 bytes)

From 000000 to 999999

Set a job ID number by the command <ID> being specified in <A>~<Z>. Set the job ID number of received data in printing when multiple received data exist.

3. Return status format

DESCRIPTION			ASCII	HEX
OFFLINE STATE	NO ERROR		0	30
	RIBBON / LABEL NEAR END		1	31
	BUFFER NEAR FULL		2	32
	RIBBON / LABEL NEAR END & BUFFER NEAR FULL		3	33
ONLINE STATE	WAIT TO RECEIVE	NO ERROR	A	41
		LABEL NEAR END	B	42
		BUFFER NEAR FULL	C	43
		RIBBON / LABEL NEAR END & BUFFER NEAR FULL	D	44
	PRINTING	NO ERROR	G	47
		LABEL NEAR END	H	48
		BUFFER NEAR FULL	I	49
		RIBBON / LABEL NEAR END & BUFFER NEAR FULL	J	4A
	STANDBY (Waiting for dispenser/cut)	NO ERROR	M	4D
		LABEL NEAR END	N	4E
		BUFFER NEAR FULL	O	4F
		RIBBON / LABEL NEAR END & BUFFER NEAR FULL	P	50
	ANALYZING/ EDITING	NO ERROR	S	53*
		LABEL NEAR END	T	54*
		BUFFER NEAR FULL	U	55*
		RIBBON / LABEL NEAR END & BUFFER NEAR FULL	V	56*
ERROR DETECTION	PAPER END		c	63
	BATTERY ERROR		d	64
	SENSOR ERROR		f	66
	HEAD ERROR		g	67
	HEAD OPEN (Unified head and cover)		h	68
	FULL MEMORY		i	69
	OTHER ERRORS		k	6B
	HEAD OVERHEAT PROTECTION		q	71

* Depending on the timing of analysis/editing, print quantity may not be set up properly

2) Cancel request command

This command enables to cancel print jobs and to clear the entire contents of receive buffer.
In this case, the printer status after this process is returned.

*When the cancel request command has been sent, wait more than 500ms before sending the next data.

*This command shall not be used during sending printing data.

1) Command CAN(HEX 18H)

2) List of status return

Status return	Description
ACK(16HEX 06H)	No error in the printer
NAK(16HEX 15H)	Error in the printer

2) Print command

This command (<A>-<Z>) starts the printing process.
In this case, command showing the printer status after receiving is returned.

1) List of status return (printer status) (Printer status)

Status return	Description
ACK(16HEX 06H)	No error in the printer
NAK(16HEX 15H)	Error in the printer

Command example of job ID number <ID>

```
<A>
<ID>01
<V>100<H>100<P>2<L>0202<XU>ABC
<Q>1
<Z>
```

Refer to the “Command Specification” for the details of job ID number command <ID>.

2.2.2 Return status of Status 4

This communication protocol is used to return the printer condition and reply as a status to the host by receiving five types of request command and print command.

Details of request commands and return status are described below.

1) Status request command

By receiving the command, job ID number of receive data in printing and printer status, number of remaining labels and job name are returned to the host. When printing is completed or there is no receive data, all"0" (HEX 30H) is returned as a number of printed labels.

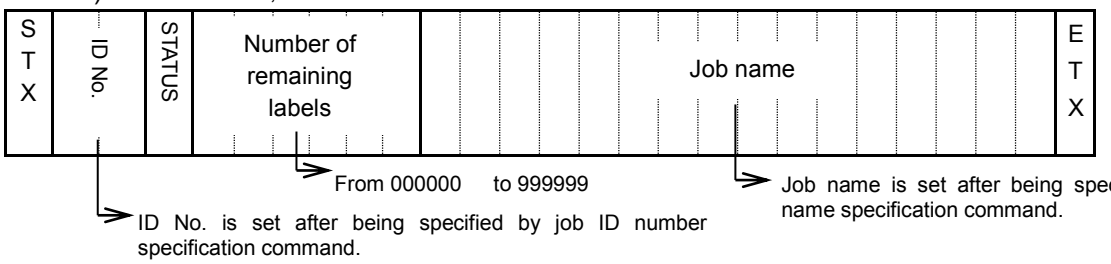
If job ID number specification command is not specified, space (HEX 20H) is returned as job ID.

Do not send ENQ (status request) while sending print data (STX <A> - <Z> ETX). If ENQ is sent, status would not be returned properly or printing would not be performed properly.

1) Command (HEX 05H)

2) Return status, Format

STX（HEX 02H）
ETX（HEX 03H）
（Total 27 bytes>



From 000000 to 999999

ID No. is set after being specified by job ID number specification command.

Job name is set after being specified by job name specification command.

3) Return status list

DESCRIPTION			ASCII	HEX	
OFFLINE STATE	NO ERROR		0	30	
	BATTERY NEAR END		1	31	
	BUFFER NEAR FULL		2	32	
	BATTERY NEAR END & BUFFER NEAR FULL		3	33	
	PRINT HALT (NO ERROR) (*)		4	34	
ONLINE STATE	WAIT TO RECEIVE	NO ERROR	A	41	
		BATTERY NEAR END	B	42	
		BUFFER NEAR FULL	C	43	
		BATTERY NEAR END & BUFFER NEAR FULL	D	44	
		PRINT HALT (NO ERROR) (*)	E	45	
	PRINTING	NO ERROR	G	47	
		BATTERY NEAR END	H	48	
		BUFFER NEAR FULL	I	49	
		BATTERY NEAR END & BUFFER NEAR FULL	J	4A	
		PRINT HALT (NO ERROR) (*)	K	4B	
	STANBY (waiting for dispenser/cutter)	NO ERROR	M	4D	
		BATTERY NEAR END	N	4E	
		BUFFER NEAR FULL	O	4F	
		BATTERY NEAR END & BUFFER NEAR FULL	P	50	
		PRINT HALT (NO ERROR) (*)	Q	51	
	ANALYZING/ EDITING	NO ERROR	S	53	Depending on the timing of analysis/editing, print quantity may not be set up properly
		BATTERY NEAR END	T	54	
		BUFFER NEAR FULL	U	55	
		BATTERY NEAR END & BUFFER NEAR FULL	V	56	
		PRINT HALT (NO ERROR) (*)	W	57	
Error detection	PAPER END		c	63	
	BATTERY ERROR		d	64	
	SENSOR ERROR		f	66	
	HEAD ERROR		g	67	
	HEAD OPEN (Unified head and cover)		h	68	
	FULL MEMORY		i	69	
	OTHER ERRORS		k	6B	
	HEAD OVERHEAT PROTECTION		q	71	

(*)PRINT HALT by print halt request command (DLE)

- **How "Receive buffer near full" is caused**

  "Receive buffer near full "occurs when the buffer's free space goes down to 0.95 MB out of the 2.95MB of receive buffer.

- **How "Receive buffer near full" is cleared**

  "Receive buffer near full" is cleared when the buffer's free space grows as much as 1.95 MB.

2) Cancel request command

This command enables to cancel print jobs and to clear the entire contents of receive buffer.
In this case, the printer status after this process is returned.
When the cancel request command has sent, wait more than 500ms before sending the next data.
Avoid CAN transmission (cancel request command) while sending the print data (<A> - <Z>). It may not be transmitted properly as CAN transmission (cancel request).

1) Command CAN(HEX 18H)
2) List of return status

Status return	Description
ACK(HEX 06H)	No error in the printer
NAK(HEX 15H)	Error in the printer

3) Print command

This command (<A> - <Z>) starts the printing process.
In this case, command showing the printer status after receiving is returned.

1) List of return status

Status return	Description
ACK(HEX 06H)	No error in the printer
NAK(HEX 15H)	Error in the printer

4) Request command to pause printing

This command halts the printing process.
In this case, the printer status is returned after receiving the command.

1) Command DLE(HEX 10H)
2) List of return status

Status return	Description
ACK(HEX 06H)	No error in the printer
NAK(HEX 15H)	Error in the printer

Avoid DLE transmission (print stop request) while sending the print data (<A> - <Z>). It may not be transmitted properly as DLE transmission (print stop request). Font data, graphic data, barcode data will not be processed as DLE transmission (print stop request)

5) Request command to resume printing

This command releases the pause mode of the printer and restarts the printing process.
In this case, the printer status after receiving the command is returned.

1) Command DC1(HEX 11H)
2) List of return status

Status return	Description
ACK(HEX 06H)	No error in the printer
NAK(HEX 15H)	Error in the printer

2.2.3 Other return status (common in status 3 and 4)

1) Request command to set printing operation.

By receiving this command, printer operation set up is returned to the host.

1) Command SOH(01H) + MG

2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+ Information on operation of printer + [ETX]

STX	RIBBON ・・・-・・・Error sound, Gap between labels	ETX

(Total 33 bytes)

3) List of return status

No.	Item	Description	Byte
1	Ribbon	00H : Not in use 01H : Thermal method	1
2	Head resolution	00H : 8dot/mm 01H : Not in use	1
3	Speed	00H : Not in use 01H : Not in use 02H : 4(inch/second) 100(mm/second) 03H : 5(inch/second) 125(mm/second) 04H : 5.6(inch/second) 140(mm/second)	1
4	Printing	00H : Continue 01H : Tear-off	1
5	Not in use	00H Fixed	1
6	Not in use	00H Fixed	1
7	Not in use	00H Fixed	1
8	Darkness	Darkness A(41H) : A B(42H) : B (Reserve) C(43H) : C (Reserve) D(44H) : D (Reserve) E(45H) : E (Reserve) F(46H) : F (Reserve) Darkness level 01H : Darkness 1 02H : Darkness 2 03H : Darkness 3 04H : Darkness 4 05H : Darkness 5 06H : Darkness 6 07H : Darkness 7 08H : Darkness 8 09H : Darkness 9 0AH : Darkness 10	2
9	Sensor Type	00H : I-Mark sensor 01H : Not in use 02H : Sensor is invalid	1
10	Zero Slash	00H : Invalid 01H : Valid（Initial value）	1
11	Kanji code	04H : GB18030 (Fix) (China model) 00H : Fix (Vietnam model, Thai model)	1
12	Not in use	00H : Fix	1
13	Initial feed	00H : Invalid（Initial value） 01H : Valid	1
14	Proportional pitch	00H : Invalid 01H : Valid（Initial value）	1
15	Size of lengthwise label	0001H-1F40H (1 - 8000 dot)	2
16	Size of crosswise label width	0001H-01B8H (1 - 440 dot)	2
17	Vertical offset (dot)	0000H-0500H (0 - 1280 dot) FFFFH-FB00H (-1 - -1280 dot)	2

No.	Item	Description	Byte
18	Horizontal offset (dot)	0000H-01B7H (0 - 439 dot) FFFFH-FE49H (-1 - -439 dot)	2
19	Stand-by time for option (Unit 100ms)	05H- C8H (5-200) Initial value : 0AH(10)	1
20	Not in use	00H : Fixed	1
21	Paper pitch Offset (dot)	00H-1EH (0-30) Initial value : 0 FFH-E2H (-1 - -30)	1
22	Tear Off Offset (dot)	00H- 1EH (0 -30) Initial value : 0 FFH- E2H (-1- -30)	1
23	Auto power off time (unit minute)	0000H-03E7H (0 - 999) Initial value : 0000H（0）	2
24	Error sound setting	00H : Not available 01H : Available（Initial value）	1
25	Gap between labels	00H -40H (0-64) Initial value : 18H(24)	1

2) Request command for information on system version

By receiving this command, information on system version of printer is returned.

1) Command SOH(01H) + SB
2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+ Printer system version + [ETX]

STX	Printer Firmware Version	Font version	Spare	ETX

(Total 52 bytes)

3) List of return status

No.	Item	Description	Byte
1	Printer Firmware Version	ASCII code	16
2	Font version	ASCII code	8
3	Spare	20H fixed	26

3) Request command for information on free memory

By receiving this command, information on free memory of printer (FLASH MEMORY) is retuned

1) Command SOH(01H) + EB
2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+ Free memory + [ETX]

STX	User free space	Total user free space	Spare	ETX

(Total 26 bytes)

3) List of return status

No.	Item	Description	Byte
1	User free space	Binary data	8
2	Total user free space	Binary data	8
3	Spare	00H Fixed	8

4) Request command for information on head status

By receiving this command, information on head status of printer is retuned.

1) Command SOH（01H）+HC

2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+Head status flag+ [ETX]

STX	Head status flag	ETX

(3 bytes)

3) List of return status

No.	Item	Contents	Byte
1	Head status flag	0 (00H)：Normal 1 (01H)：Head error	1

5) Request command for printer counter

By receiving this command, information on printer counter is returned.

1) Command SOH (01H)+ME

2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+Information on printer counter+ [ETX]

STX	Life counter	Head counter 1	Head counter 2	Head counter 3	Not in use	Not in use	ETX

(30 bytes)

3) List of return status

No.	Item	Description	Byte
1	Life counter	Current life counter (dot)	8
2	Head counter 1	Current life counter (dot)	4
3	Head counter 2	Previous head counter (dot)	4
4	Head counter 3	Head counter (The last before one) (dot)	4
5	Not in use	00H Fixed	4
6	Not in use	00H Fixed	4

6) Request command for information on sensor level

By receiving this command, information on sensor level of printer is returned.

1) Command SOH（01H）+SG

2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+Information on sensor level+ [ETX]

STX	I-Mark sensor level	Not in use	Not in use	Cover open sensor	ETX

(6 bytes)

3) List of return status

No.	Item	Description	Byte
1	I-Mark sensor level	AD converted value [0～255] Binary data	1
2	Not in use	00H fixed	1
3	Not in use	00H fixed	1
4	Cover open sensor	0 (00H)：Cover close 1 (01H)：Cover open	1

7) Request command for information on battery

By receiving this command, information on battery is returned.

1) Command SOH (01H)+BI

2) Return status, Format

STX(HEX 02H)
ETX(HEX 03H)

[STX]+Information on battery+ [ETX]

STX	Information on battery	Spare	ETX

(8 bytes)

3) List of return status

No.	Item	Description	Byte
1	Information on battery	Return information on battery output voltage (ASCII code) 0 (30H) : Less than 7.25V (Low battery error) 1 (31H) : 7.25V or more, Less than 7.47V (Battery near end) 2 (32H) : 7.47V or more, Less than 7.7V 3 (33H) : 7.7V or more	1
2	Spare	00H Fixed	5

8) Request command for stand-by time for option

By receiving this command, stand-by time for tear-off operation of printer is returned.

1) Command SOH(01H) +TW

2) Return status, format

[STX]+ Stand-by time for option + [ETX]

STX	Stand-by time for option	ETX

STX(HEX 02H)
ETX(HEX 03H)
(3 Bytes)

3) List of return status

No.	Item	Description	Byte
1	Stand-by time for option	Stand-by time until tear off operation starts after printing is completed in tear-off mode. (5-200) (Unit: 100ms) (Binary data)	1

9) Command request for information on Bluetooth interface

By receiving this command, information on Bluetooth interface is returned to the host.

1) Command SOH（01H）+H6

2) Return status format

STX (HEX 02H)
ETX (HEX 03H)

[STX]+ Information on Bluetooth interface+ [ETX]

STX	Bluetooth mode	PIN code	Name of device	Authentication mode	ISI	ISW	PSI	PSW	CRC	ETX

(57 Bytes)

3) List of return status

No.	Item	Description	Byte
1	Bluetooth mode	0 (00H) : Status (Exclusive protocol for driver) 1 (01H) : Status 3	1
2	PIN code	ASCII code *	16
3	Name of device	ASCII code *	20
4	Authentication mode	0 (00H) : Authentication level 1 1 (01H) : Authentication level 2-1 2 (02H) : Authentication level 2-2 3 (03H) : Authentication level 3 4 (04H) : Authentication level 4	1
5	ISI	Return configured ISI	4
6	ISW	Return configured ISI	4
7	PSI	Return configured ISI	4
8	PSW	Return configured ISI	4
9	CRC	0 (00H) : Invalid 1 (01H) : Valid	1

*00H is added after data if number of byte is less than specified number of byte.

2.3 Status3

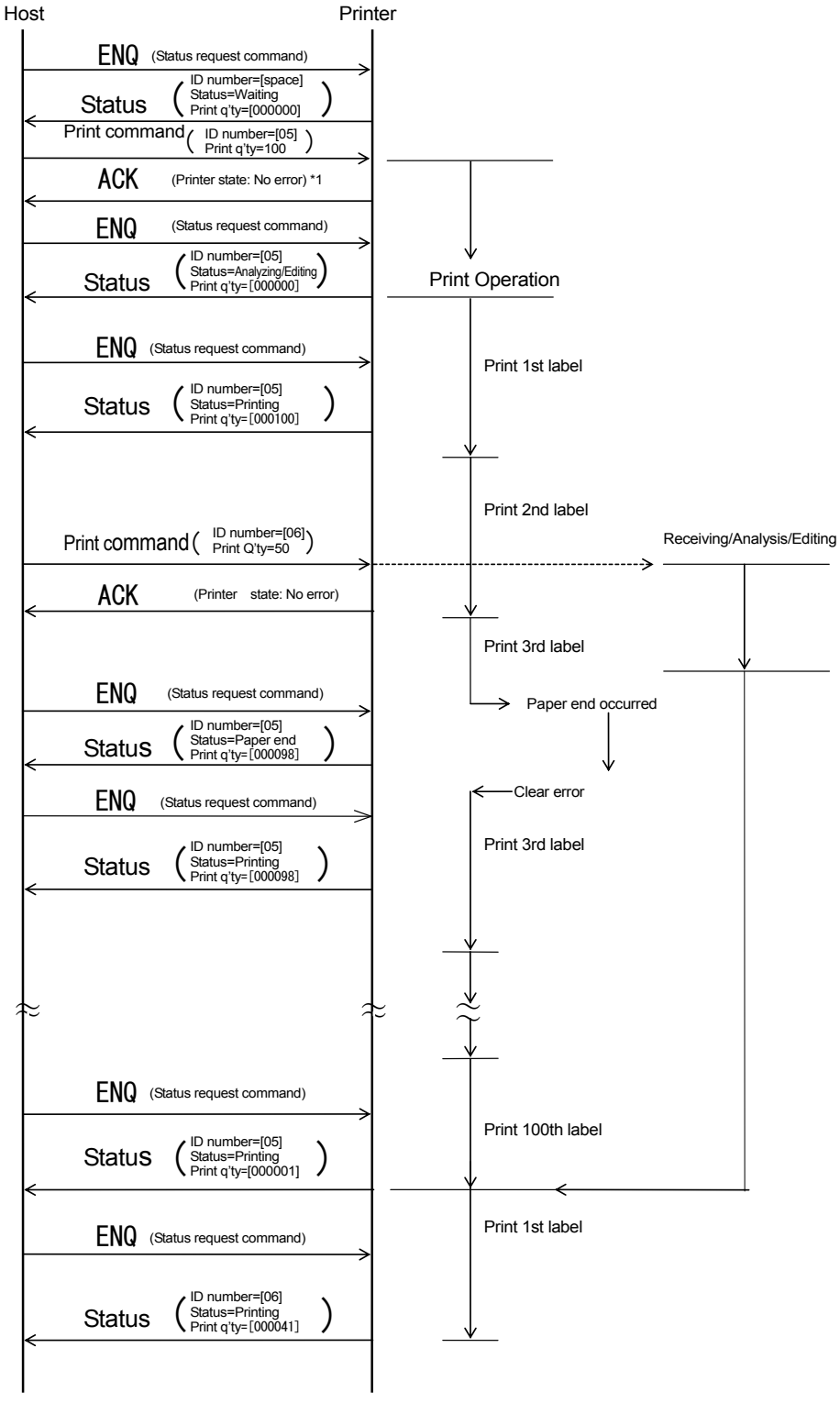
The purpose of this communication protocol is to control printer status on the host. With the request command from the host, the printer returns the status.

Refer to 2.2.1 Return status of Status 3 for the details of request command and return status

2.3.1 Return sequence

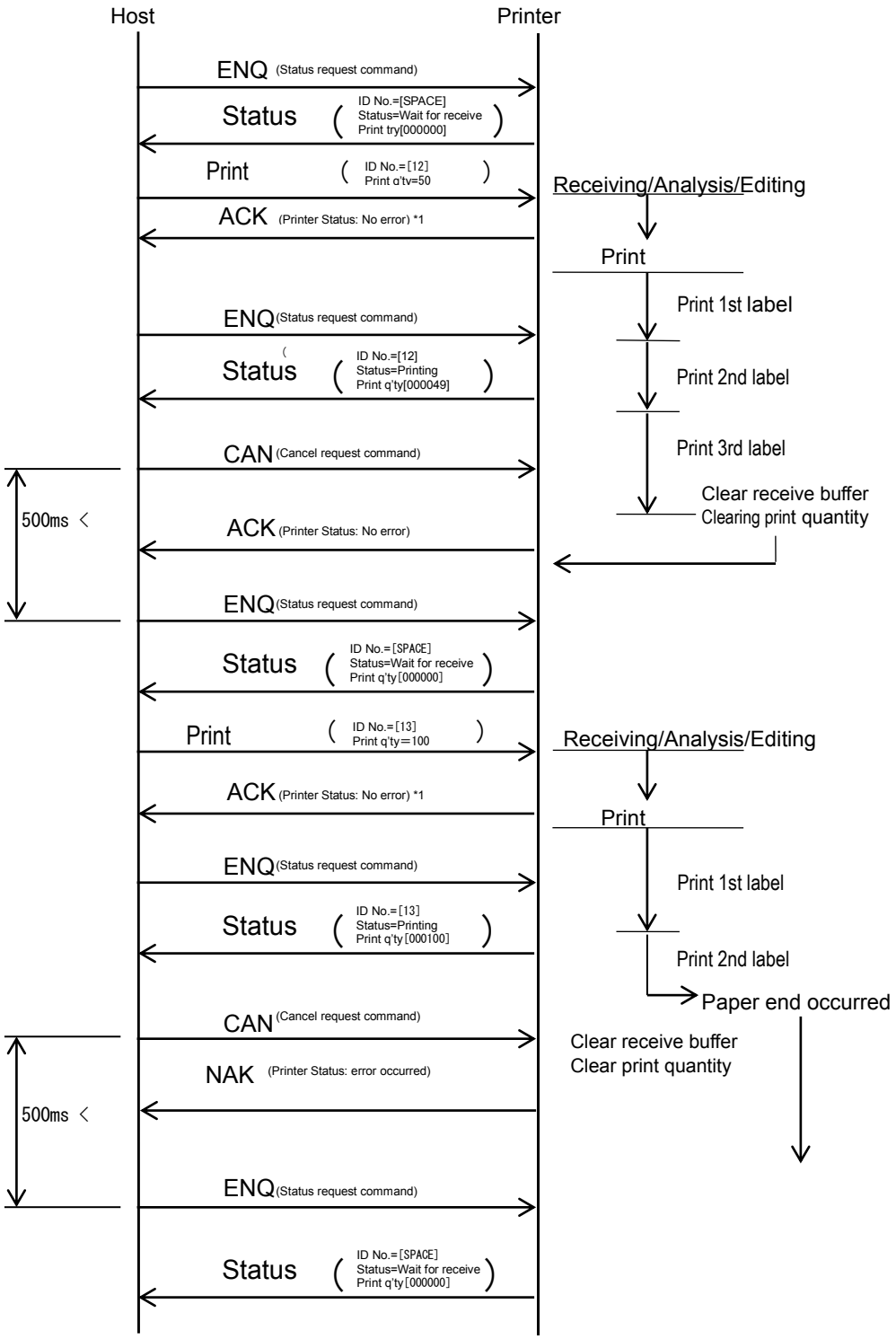
*1 Responds to print command only when Bluetooth.

1) Normal process



2) Cancel request command

*1 Responds to print command only when Bluetooth.



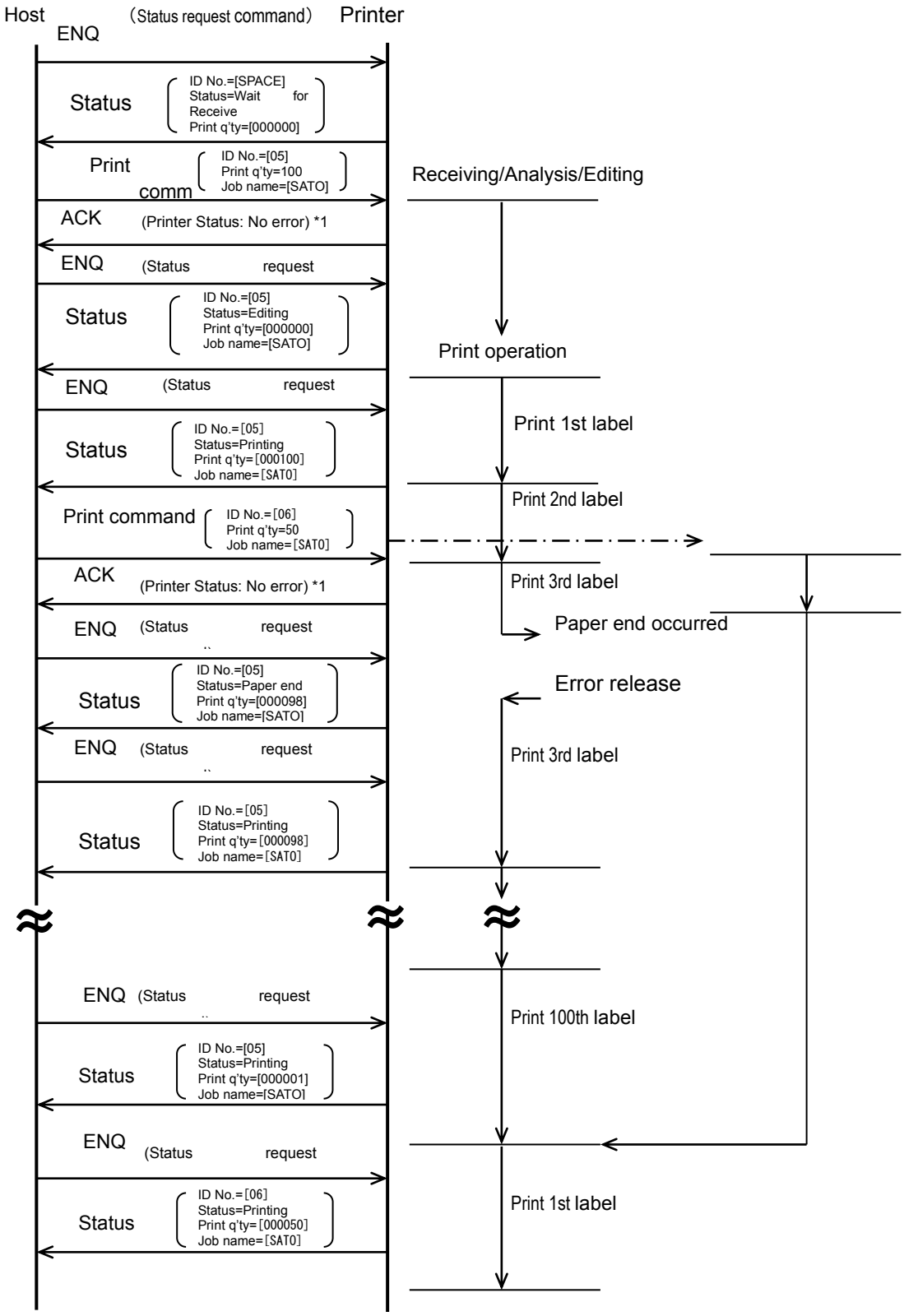
2.4 Status 4

This communication protocol is designed for the purpose of controlling print status in the host, and the printer status is returned by the request command from the host.
For the details of the request command and the return status, refer to 2.2.2 Return status of Status 4 and 2.2.3 Other return status (common in status 3 and 4).

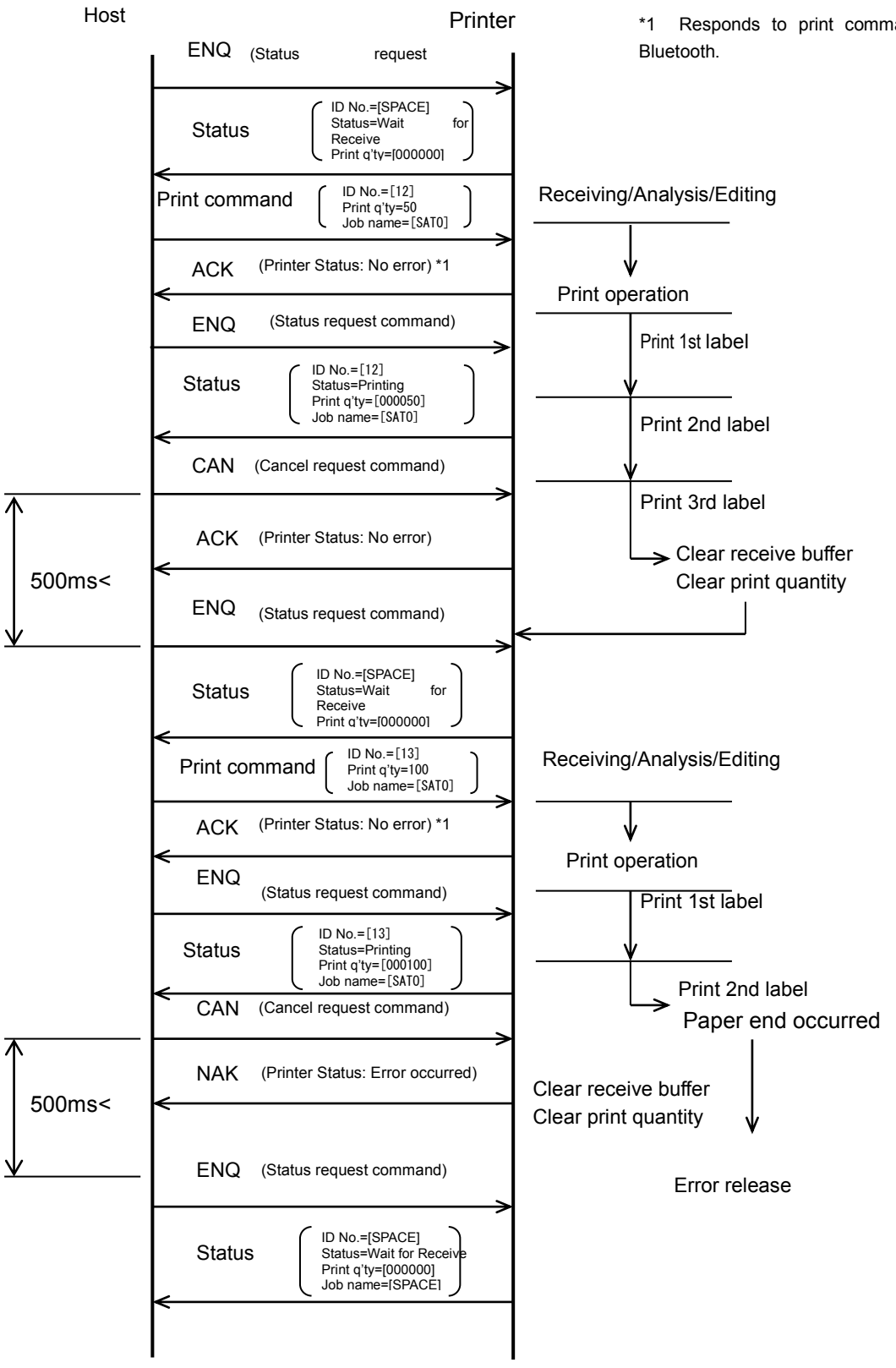
2.4.1 Return sequence

*1 Responds to print command only when Bluetooth.

1) Normal operation



2) Cancel request command

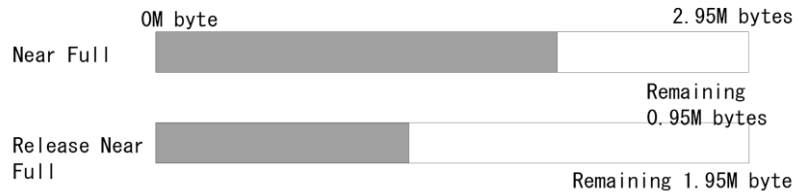


*1 Responds to print command only when Bluetooth.

3 USB

3.1 Basic specification

USB interface of this printer comply with USB2.0 standard.

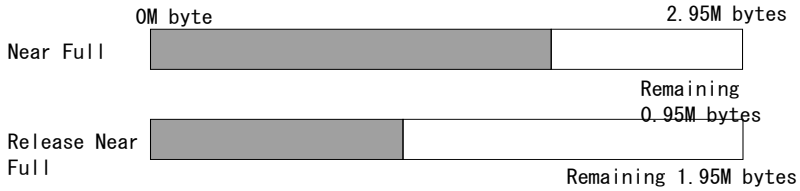
Protocol	Status 4
Connector	Mini B type
Version	USB2.0 High-speed
Maximum receive buffer capacity	2.95 megabytes 

3.2 Layout plan for connector pin

Pin number	Name
1	VBus
2	-Data(D-)
3	+Data(D+)
4	OPEN
5	GND

4 Bluetooth

4.1 Basic specification

Item	Description
Standard	Bluetooth Ver. 3.0+EDR Power Class 2
Communication distance	10m (Specified measurement environment)
Profile for use	Serial Port Profile（SPP） *1
Operation mode	Slave mode
Maintenance feature (Valid only when connecting Bluetooth interface)	Printing information on Bluetooth setting Print information on Bluetooth setting on user test printing and factory test printing. Initialization of information on Bluetooth setting. Initialize information on Bluetooth setting by factory setting/communication setting in initialization mode and all clear in factory clear mode (Refer to operation specifications for details.)
Authentication level	・Level 1 No authentication ・Level 2-1 PIN code authentication, Service level, No encryption ・Level 2-2 PIN code authentication, Service level, Encryption ・Level 3 PIN code authentication, Link level, No encryption ・Level 4 Support for secure simple pairing, Service level, Encryption (Able to communicate with device without secure simple pairing) * Use only [JustWorks] for authentication
PIN code	ASCII code in 1-16 digits (30H-39H)
Power saving mode	sniff、park、hold (Operate according to host setting)
CRC time out	10 seconds (Fixed)
Maximum receive buffer capacity	2.95 megabytes 
Code	ASCII(7 bits), Graphic (8 bit)
Pairing	Keep link keys for 10 devices
CoD (Class of) Device)	Major service class：Unspecified Major device class：Imaging major class Minor device class：Printer

*1 SPP defines connection of two Bluetooth supported devices by establishing virtual serial port

[Notes]

(1) Printer operates in slave mode. Before establishing connection, specify Bluetooth Device address (BD address) from the master.

(2) Connection may not be established when PIN code is different from above setting. In that case, confirm PIN code by test print, match with master setting and try reconnection.

(3) Bluetooth interface and printer is connected by internal serial interface, and transfer rate is 750000 bps.

(4) When Bluetooth LINK is lost (e.g. out of service area), disconnects from the printer after supervision timeout period has passed.

(5) When Bluetooth communication is disconnected while sending print data (STX -ETX), the received data is discarded after CRC time-out period (10 seconds) has passed. It is required to resend print data (STX -ETX) if CRC time-out time has passed. CRC time out is not monitored if CRC check is set to invalid.

(6) The same operation in authentication 2-1 and 2-2.

(7) ACK/NAK is returned when CRC check result is normal and CRC check is valid.

4.2 Bluetooth settings

See below for the settings for Bluetooth interface, which can be set by command. Refer to command specification for details.

(1) Authentication level (Level 1, level 2-1, level 2-2, level 3, level 4)

(2) Communication (ISI、ISW、PSI、PSW)

Bluetooth module has setting values of ISI, ISW, PSI, PSW, and the details are described in the list below.

Setting	Description
ISI (Inquiry Scan Interval)	ISW time interval (0000,0012-1000) (every 0.625ms)
ISW (Inquiry Scan Window)	Response time for search request from the host (0000,0011-Setting value of ISI) (every 0.625ms)
PSI (Page Scan Interval)	PSW time interval (0012-1000) (every 0.625ms)
PSW (Page Scan Window)	Response time for connection request from the host (0011-Setting value ofPSI) (every 0.625ms)

・When ISI=0000 and ISW=0000, device search from master device can be rejected.

・ Initial values of factory clear are ISI=0x800 (1.28 sec), ISW=0x12 (11.25ms), PSI=0x90(90ms), and PSW=0x12(11.25ms).

・It is prohibited to set as ISI<ISW nor PSI<PSW.

・Normally communication parameter doesn't need to be changed. However it needs to be adjusted when the radio wave signals are low.

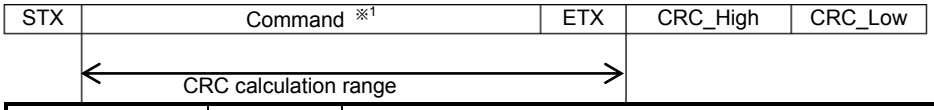
(3) Device name (Alphanumeric and symbols (20H,21H,23H~7EH) 1~20 digits)

Any device name can be set and displayed on connected device to identify the printer.

Note) Initialized communication parameter is set to Bluetooth interface as turning on the power of printer for the first time after it was set. Do not turn off the power of printer until printer is booted normally for reboot.

4.3 CRC transmission data

When CRC check mode is selected, transmit data format needs to be configured as follows.



Item	HEX(H)	Description
STX	02	Transmission control character to start text
Command	—	Command + Parameter
ETX	03	Transmission control character to end text
CRC	2bytes	Calculate by CRC-ANSI. Sends High first then Low with error control value calculated by CRC-16(generating polynomial $X^{16}+X^{15}+X^{2}+1$ *2).

1) Start of Data Transmission <A> and End of Data Transmission <Z> are set to the command. STX and ETX must to be set in transmission data. When printer cannot receive STX or ETX, print operation is not executed.
2) Since it is a right shift, the actual value used for calculation would be 0xA001. Default value is 0.

4.4 CRC calculation data

A part of CRC calculation process when sending print speed <CS> is shown below as an example.
Transmission data is STX <A> <CS>2 <Z> ETX, or "02 1B 41 1B 43 53 32 1B 5A 03" in HEX. The underlined area is CRC calculation range. Generating polynomial is expressed "1010 0000 0000 0001" as binary numbers. 1B is the first object of calculation and it is expressed "0001 1011" as binary numbers. Default value of CRC is "0".

(1) CRC = CRC XOR Object data(1B)

```
          0000 0000 0000 0000   (CRC)
XOR)      0000 0000 0001 1011   (1B)
CRC =     0000 0000 0001 1011
```

(1-1) A=CRC AND "0001"
CRC= shift 1bit right of CRC

```
A = 1
CRC =  0000 0000 0000 1101
```

(1-1) If A=1, CRC XOR Polynomial, and assign the result to CRC.
If A=0, do nothing

```
          0000 0000 0000 1101   (CRC)
XOR)      1010 0000 0000 0001
(Polynomial)
CRC = 1010 0000 0000 1100
```

(2-1) Calculate the same as (1-1), and repeat (1-1) and (1-2) calculation seven times. (8bits in total)

```
A = 0
CRC =  0101 0000 0000 0110
```

(2-2) Calculate the same as (1-2). CRC is as it is since A=0.	CRC = 0101 0000 0000 0110
(3-1) Calculation the same as (1-1).	A = 0 CRC = 0010 1000 0000 0011
(3-2) Calculate the same as (1-2).	CRC = 0010 1000 0000 0011
(4-1) Calculation the same as (1-1).	A = 1 CRC = 0001 0100 0000 0001
(4-2)Calculate the same as (1-2).	0001 0100 0000 0001 (CRC) XOR) 1010 0000 0000 0001 (Polynomial) CRC = 1011 0100 0000 0000
(5-1) Calculate the same as (1-1).	A = 0 CRC = 0101 1010 0000 0000
(5-2) Calculate the same as (1-2).	CRC = 0101 1010 0000 0000
(6-1) Calculate the same as (1-1).	A = 0 CRC = 0010 1101 0000 0000
(6-2) Calculate the same as (1-2).	CRC = 0010 1101 0000 0000
(7-1) Calculate the same as (1-1).	A = 0 CRC = 0001 0110 1000 0000
(7-2) Calculate the same as (1-2).	CRC = 0001 0110 1000 0000
(8-1) Calculate the same as (1-1).	A = 0 CRC = 0000 1011 0100 0000
(8-2) Calculate the same as (1-2).	CRC = 0000 1011 0100 0000
CRC calculation for “1B” is completed. Repeat the same calculation of (1) for next object data “41” until “03”. In this case EC 5E.	Calculation result by 03 CRC = 1110 1100 0101 1110

4.5 Example of transmission data

Example of transmission data is shown below.

(1) Print data

STX
<A>
<XM>SATO
<Q>0001
<Z>
ETX
71H 9CH

HEX data to be sent is as below. CRC is shown with underline.

02 1B 41 1B 58 32 32 2C 53 41 54 4F 1B 51 30 30 30 31 1B 5A 03 71 9C

(2) Print speed specification command<CS>

STX
<A>
<CS>2
<Z>
ETX
ECH 5EH

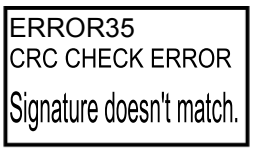
HEX data to be sent is following. CRC is shown with underline.

02 1B 41 1B 43 53 32 1B 5A 03 EC 5E

4.6 Showing CRC error

The printer checks the validity of receive data by calculating CRC for each job received and comparing with the received CRC. The receive data is proven to be invalid if both CRC doesn't match, then it stops printing by generating the "CRC error" at the point when this item starts printing.

Display when CRC CHECK ERROR is occurred.



※ CRC CHECK ERROR is detected only when CRC check is marked as valid.

There are 2 ways to clear CRC error as below:

1) Hold down [Print/Select] key	: Resumes printing from the print data with CRC error
2) Send CAN command	: Clears all contents of receive buffer including print data with CRC error.

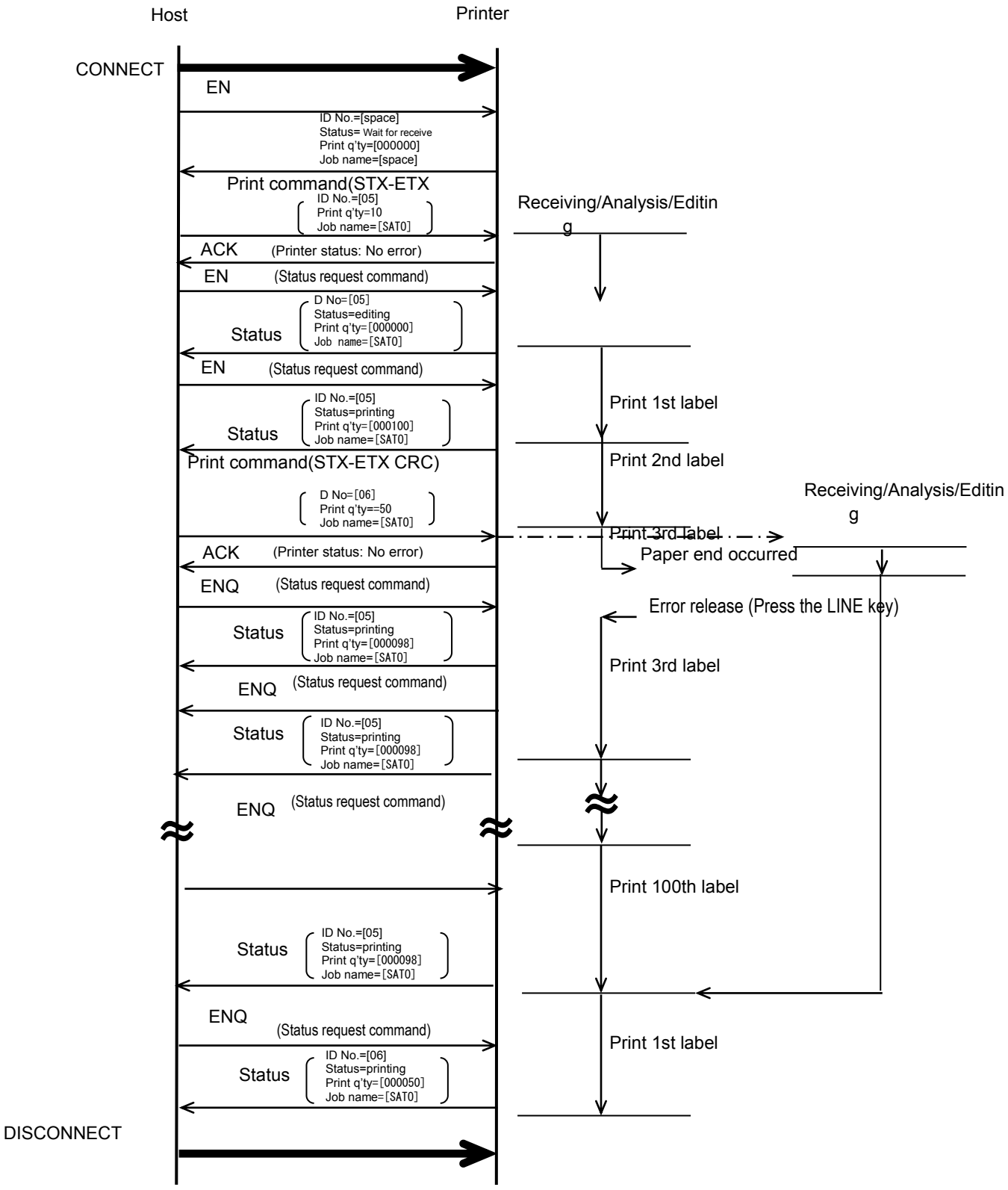
4.7 Low power consumption mode.

This is a feature to transit Bluetooth module to low power consumption mode if no data communication is performed for certain period while connection is established with master device. Low power consumption mode in this feature is Sniff mode. It is possible to enable or to disable this feature. Feature is set to invalid by default. Use ESC+IL of SBPL command for setting. Refer to [Bluetooth low power consumption mode time(ESC+IL)]of command specifications for details.

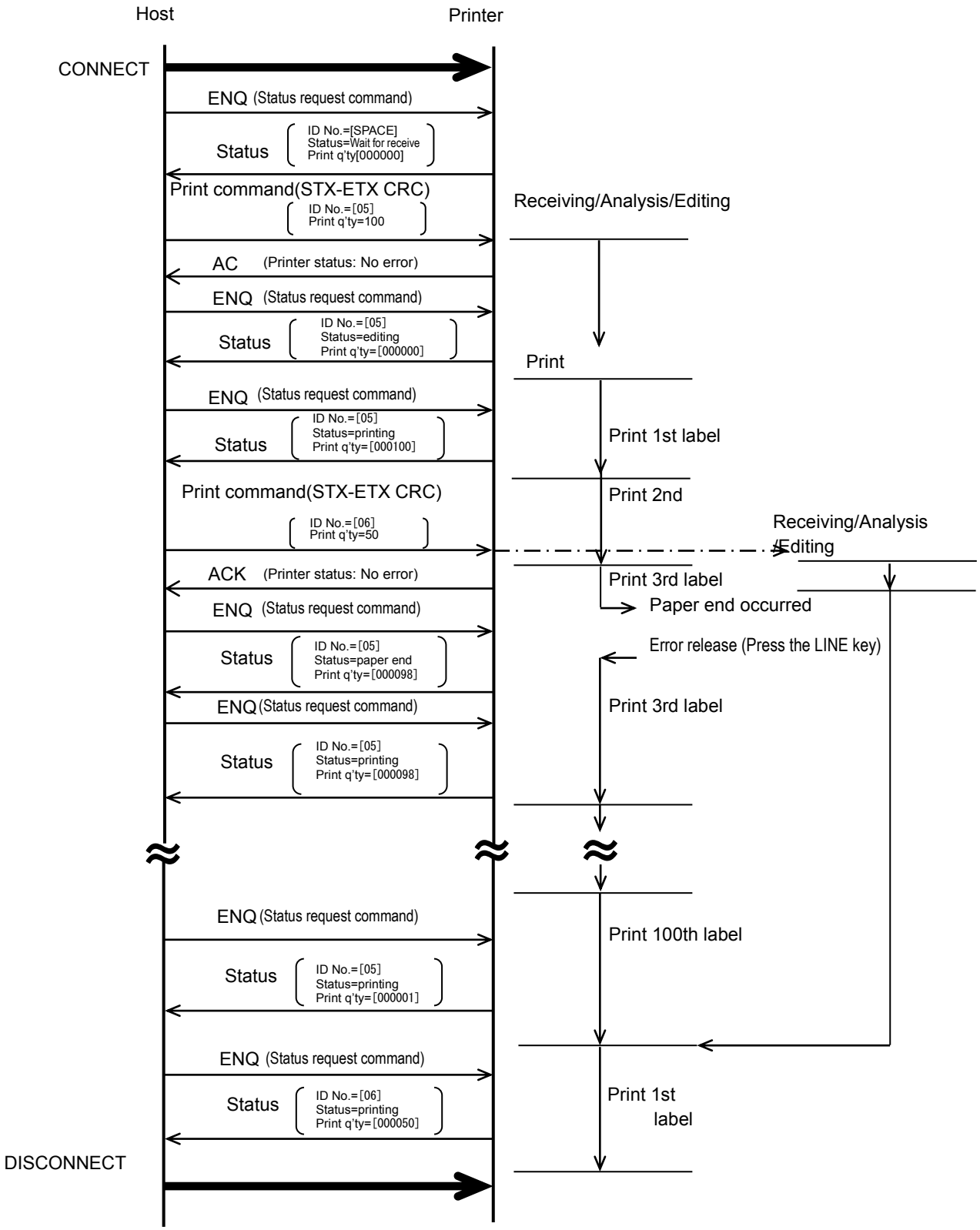
4.8 Transmission sequence

4.8.1 Normal termination

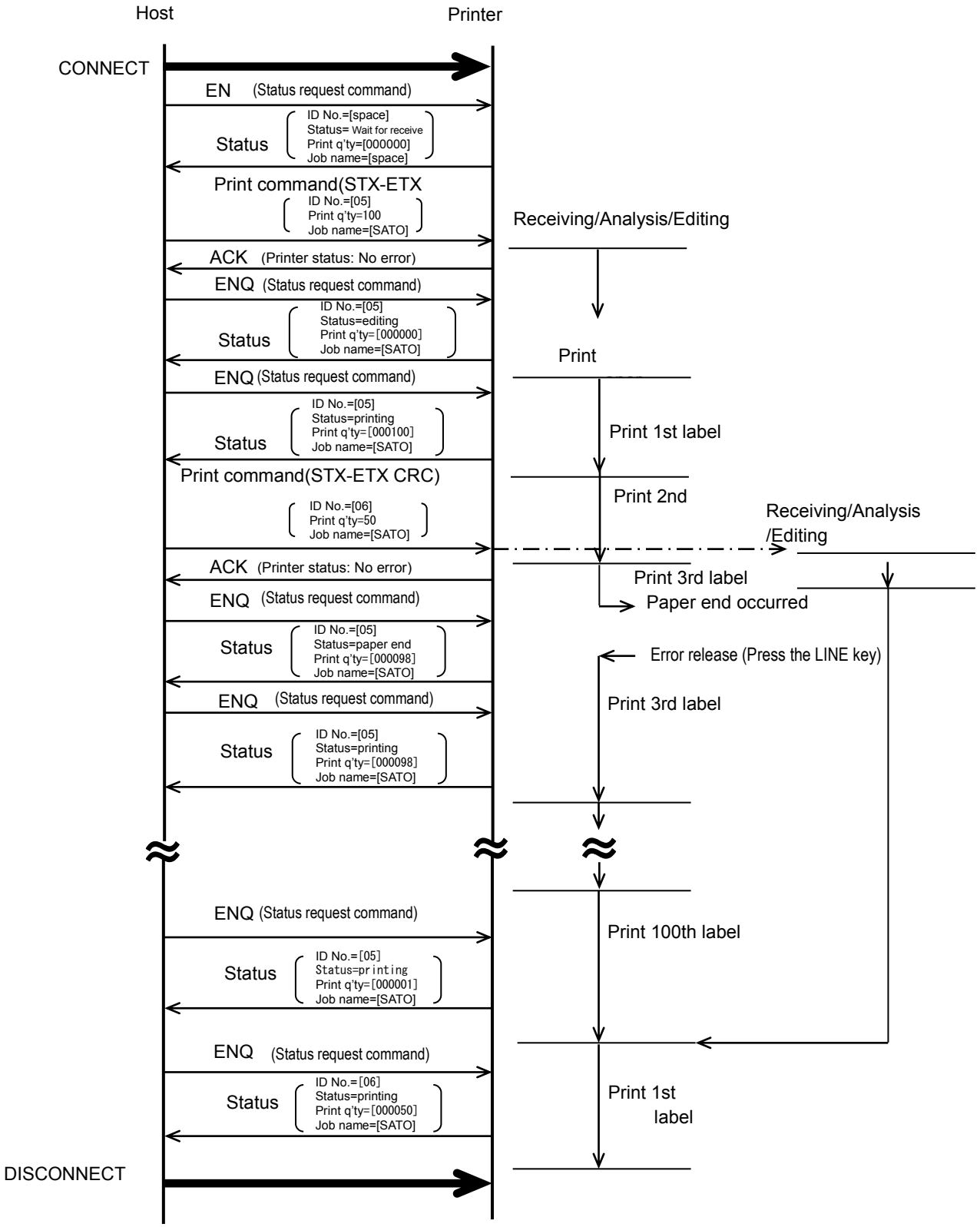
4.8.1.1 In case of Status 4 (CRC check is valid)



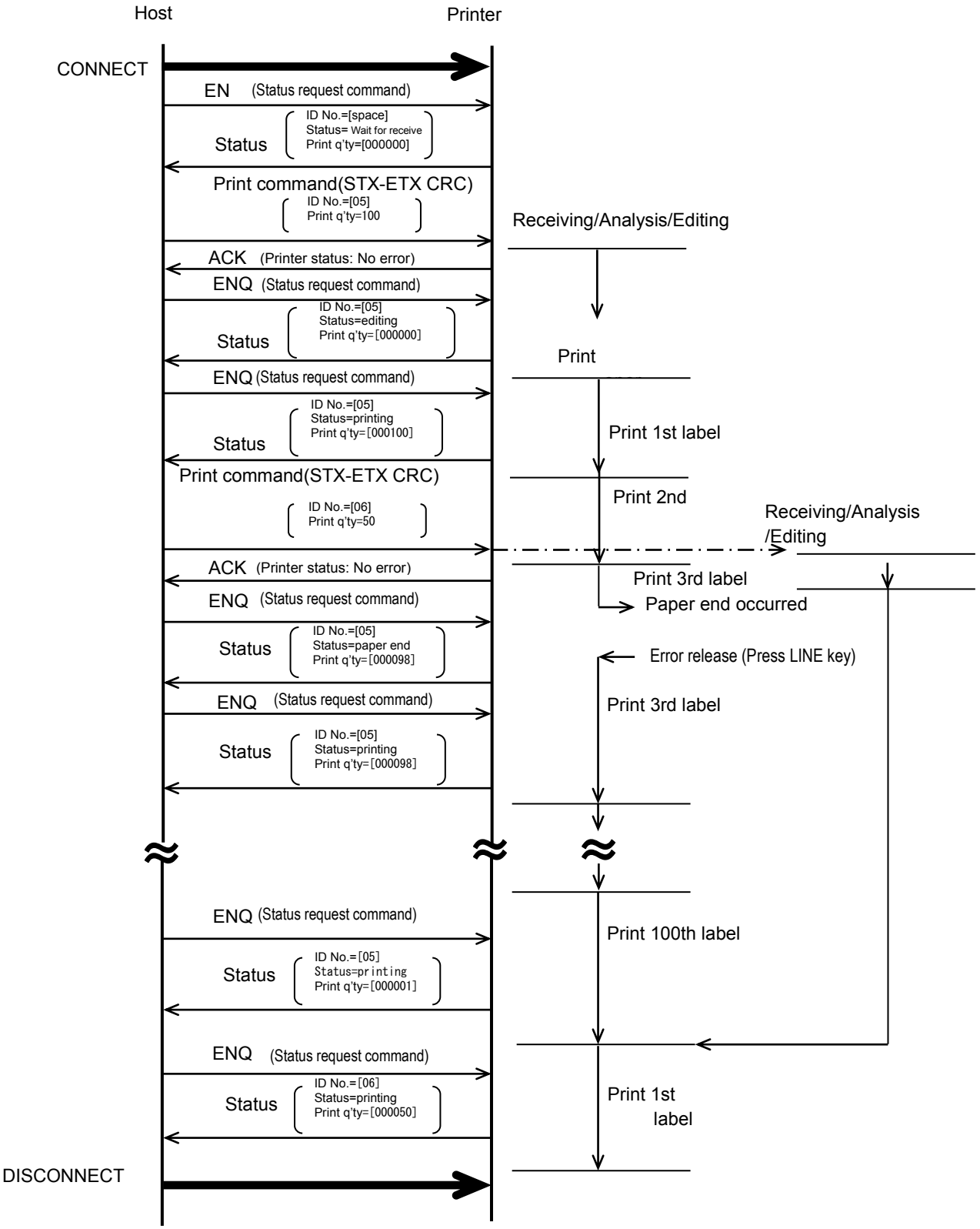
4.8.1.2 In case of Status 3(CRC check is Enabled)



4.8.1.3 In case of Status 4(CRC check disabled)



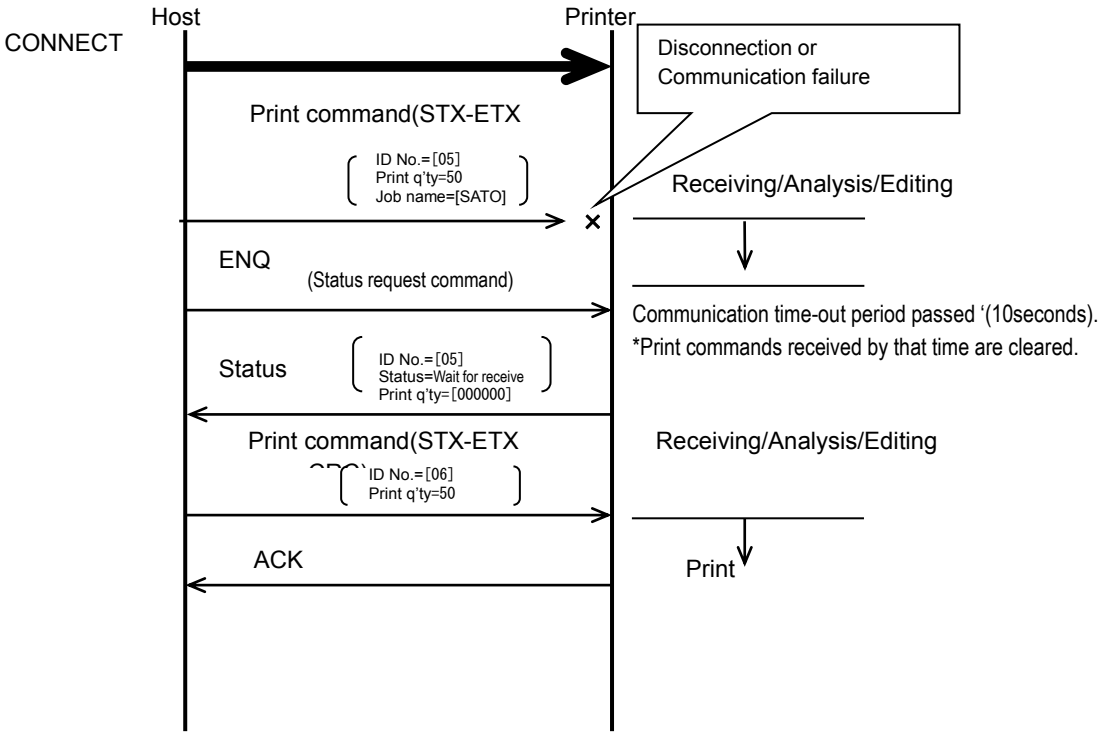
4.8.1.4 In case of Status 3 (CRC check disabled)



4.8.2 In case of communication breakdown while transmitting print data

The print data cannot be guaranteed if Bluetooth is disconnected while sending print data. Make sure to power off and power on the printer to retransmit the print data.

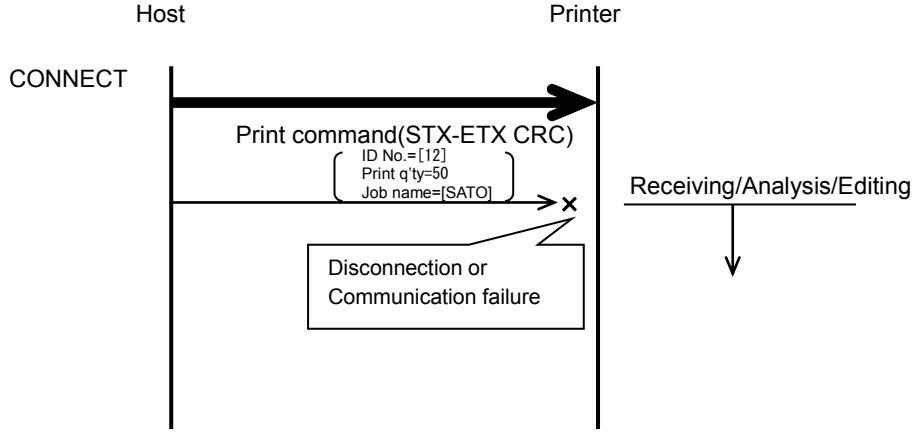
4.8.2.1 In case CRC check is enabled (for both Status 3 and 4)



[Note]

1. In case Bluetooth communication is disconnected and communication time-out period (10 seconds) has passed while transmitting print data, the data received until then are cleared.

4.8.2.2 In case CRC check is disabled (for both Status 3 and 4)

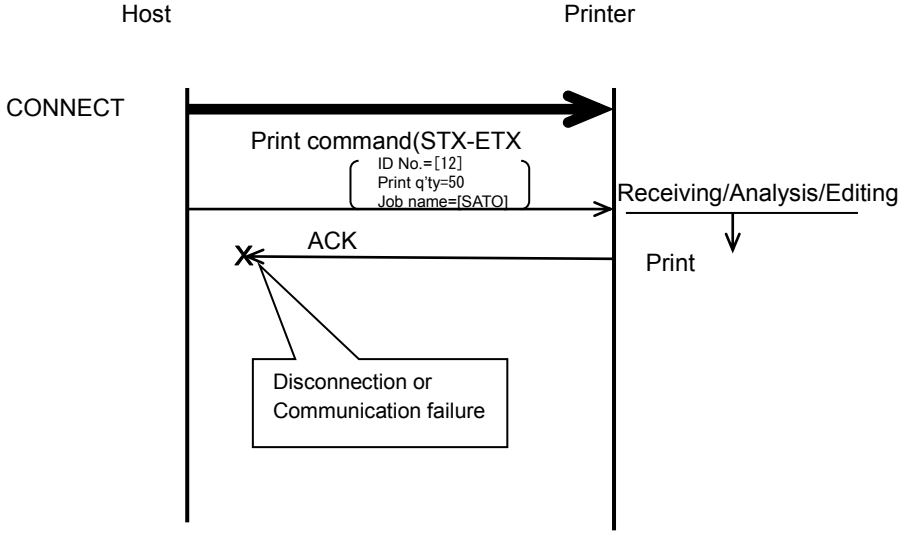


[Note]

1. Print data is not guaranteed if Bluetooth communication is disconnected while sending print data, just as above. Resend print data after reboot.

4.8.3 In case of communication breakdown while sending status after transmitting print data

4.8.3.1 In case CRC check is enabled (for both Status 3 and 4)



[Note]

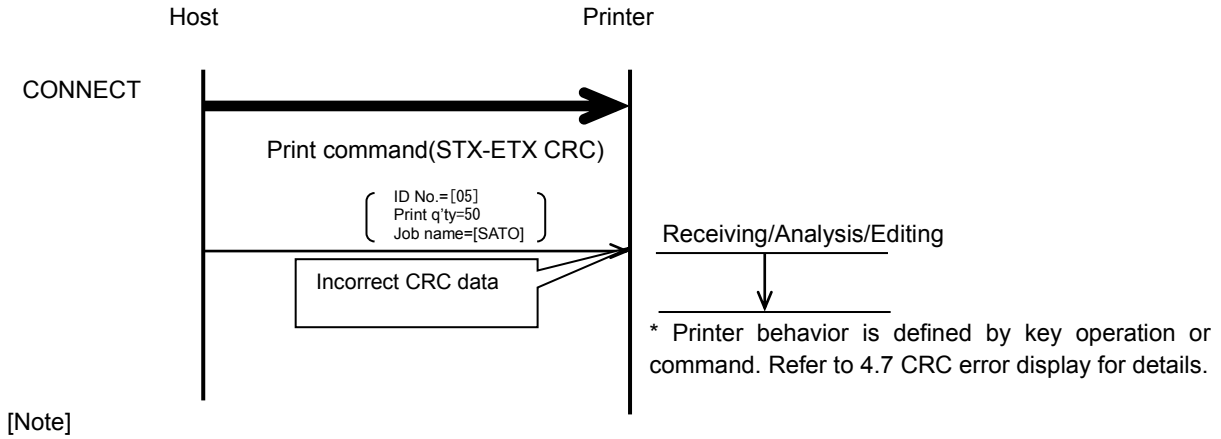
1. When ACK is not returned after sending print data, take it as communication failure and stop transmission.
2. ACK may not return when Bluetooth communication is disconnected before printer returns ACK.

4.8.3.2 In case CRC check is disabled (for both Status 3 and 4)

Works the same as 4.8.3.1 CRC check enabled.

4.8.4 Abnormal end when CRC check is enabled

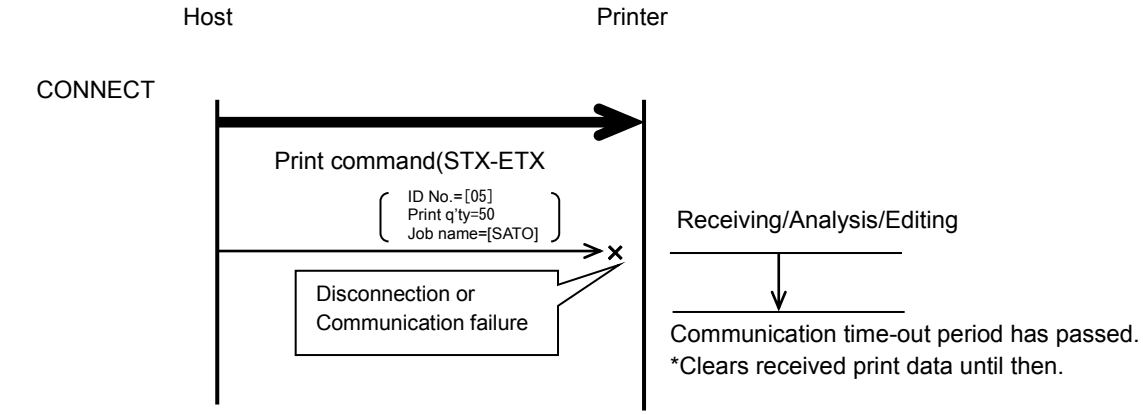
4.8.4.1 In case of CRC error（for both Status 3 and 4）



[Note]

1. Received data is cleared and ACK/NAK is not returned when the received printer data has CRC error.

4.8.4.2 In case of communication timeout (for both Status 3 and 4)



[Note]

1. In case data is not received in communication time-out period (10 sec) while receiving print command, time-out occurs to clear received print data.
（ACK/NAK is not returned>）

5 Notes

■On behavior after power off

Note that the data sent from host to printer after turning off the power is not guaranteed.

Extensive contact information for worldwide SATO operations can be found on the Internet at **www.satoworldwide.com**

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