Line Thermal Printer
StarPRNT
Command Specifications

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Command Description

Outline

This specification is a command specification for StarPRNT of line thermal printer.

Information contained herein applies to the following models.

< Applicable Models: >
·SK1-211 Series
  SK1-211SF2-Q-SP
  SK1-211SF2-LQP-SP (PR-SK1-21 equipped model)
  SK1-211SF2-LQW-SP (PR2-SK1-21 equipped model)

·SK1-221 Series
  SK1-221SF2-Q-SP
  SK1-221SF2-LQP-SP (PR-SK1-21 equipped model)
  SK1-221SF2-LQW-SP (PR2-SK1-21 equipped model)

·SK1-311 Series
  SK1-311SF4-Q-SP
  SK1-311SF4-LQP-SP (PR-SK1-31 equipped model)
  SK1-311SF4-LQW-SP (PR2-SK1-31 equipped model)

·SK1-321-SP Series

·SK1-41-SP Series

·SK5-31-SP Series

1.1 Operation Mode

Applicable dedicated commands are listed as following.

    StarPRNT   StarPRNT Emulation

1.2 Description of Number

Hex decimal number	<Number>	Example	<31>, <41>
Decimal number	Number	Example	1, 100, 255
Binary number	<Number> B	Example	<xxxxxxx0> B, <xxxxxxx1> B
ASCII	'Number'	Example	'0', '1'

1.3 Character Set

All data sent from the host computer are automatically converted to single byte alphanumeric characters and symbols.
For contents of character set, please refer to Character Code Table.

1.4 Control Commands

Control commands are used for controlling the operations of the printer such as starting/stopping Line feeding and paper feeding. All functions related to type of characters, enlarging characters, Setting of format and graphic printing are controlled.

1.5 Data control function

Control commands have data control function to send the status of printer to host systems.
The following is shown in details of sending functions.

・To carry out at the time of expanding the input buffer, there is a possibility of the transmitting delay due to the printing, cutting and paper feeding operations happened in the input buffer condition.
・Execute sending the command without checking the status of host system.
・It is valid for Virtual Com Interface.
・In the printer device class as well, it is available for response function, but, it can be obtained via SDK and Driver.
  For the details, refer to the specification attached to the printer driver.

1.6 COMMAND DETAILS

·Reception buffer

The buffer for storing data (reception data) received from the host, as it is called the reception buffer.

Reception data is temporarily stored in the reception buffer, then processed sequentially.

·Line buffer

The buffer for storing image data for printing is called the line buffer.

·Line buffer full

The state in which the buffer has no more space available is called line buffer full. When the buffer is full in standard mode, data in the line buffer is printed and a line feed is performed when new print data is processed. This is the same as a Line Feed. When the line buffer is full in the page mode, the printer moves the print position to the head of the next line then starts with the new print data.

·Top of line

The top of line is a state that satisfies the following conditions.
   (1) There is currently no print data in the line buffer.
   (2) The position is not specified with the horizontal direction position command.

·Printable region

This is the maximum printable area with the printer's specifications.

·Print region

This is the printing area specified by a command. (Print region ≤ Printable region)

·ANK character base line

The base line is the upper end of each data.
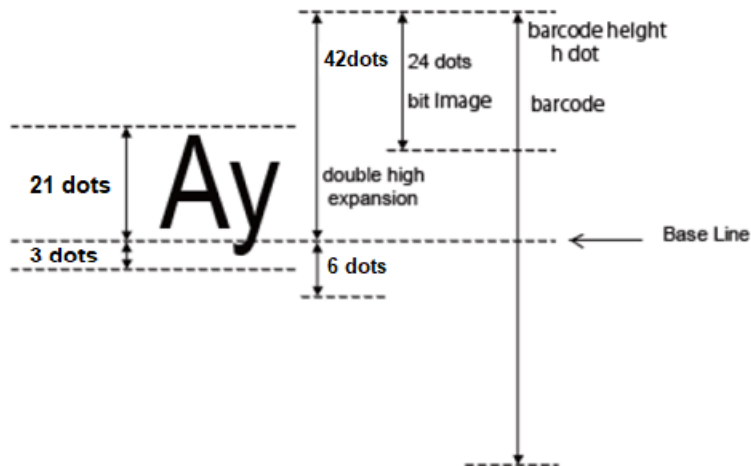
·ASB Function

Sends the automatic status to the host each time the printers status changed.

·NSB Function

When the printer uses USB I/F, sends the automatic status each time the reverse transfer mode is entered.

StarPRNT Command Details

1. Font style and Character set

ESC RS F n

[Name]	Select Font
[Code]	ASCII	ESC	RS	F	n
	HEX	1B	1E	46	n
	DEC	27	30	70	n
[Defined Area]	0≤n≤1
[Initial Value]	n = 0
[Function]	Selects a font

n	Font
0	Font-A (12x24 dot)
1	Font-B (8x16 dot)

ESC GS t n

[Name]	Select code page
[Code]	ASCII	ESC	GS	t	n
	HEX	1B	1D	74	n
	DEC	27	29	116	n
[Defined Area]	0≤n≤255
[Initial Value]	Memory switch setting
[Function]	Specifies code page

n	Code Page	Font-A	Font-B
0	Normal*	O	O
1	CodePage437 (USA Std.Europe)	O	O
2	Katakana	O	O
3	CodePage437(USA Std.Europe)	O	O
4	Codepage858(Multilingual)	O	O
5	Codepage852(Latin-2)	O	O
6	Codepage860(Portuguese)	O	O
8	Codepage863(Canadian French)	O	O
9	Codepage865(Nordic)	O	O
10	Codepage866(Cyrillic Russian)	O	O
12	Codepage857(Turkey)	O	O
13	Codepage862(Israel (Hebrew))	O	O
14	Codepage864(Arabic)	O *1	O *1
15	Codepage737(Greek)	O	O
32	Codepage1252(Windows Latin-1)	O	O
33	Codepage1250(Windows Latin-2)	O	O
34	Codepage1251(Windows Cyrillic)	O	O

*1. Codepage864: Font-A is 16x24 dots and Font-B is 12x16 dots

ESC R n

[Name]　　Specify international character set

[Code]　　ASCII　　ESC　　R　　n

　　　　　HEX　　1B　　52　　n

　　　　　DEC　　27　　82　　n

[Defined Area]　　0≦n≦8, 48≦n≦56

[Initial Value]　　Memory switch setting

[Function]　　　Specifies international characters

n	International Characters
0, 48	USA
1, 49	France
2, 50	Germany
3, 51	UK
4, 52	Denmark
5, 53	Sweden
6, 54	Italy
7, 55	Spain
8, 56	Japan

ESC / n

[Name]　　Specify/Cancel slash zero

[Code]　　ASCII　ESC　　/　　n

　　　　　HEX　　1B　　2F　　n

　　　　　DEC　　27　　47　　n

[Defined Area]　　0≦n≦1, 48≦n≦49

[Initial Value]　　Memory switch setting

[Function]　　　Specifies and cancel slash zeros.

n	Contents
0, 48	Cancels slash zero
1, 49	Specifies slash zero

ESC SP n

[Name]　　Set ANK right space

[Code]　　ASCII　ESC　　SP　　n

　　　　　HEX　　1B　　2F　　n

　　　　　DEC　　27　　32　　n

[Defined Area]　　0≦n≦15, 48≦n≦57, 65≦n≦69

[Initial Value]　　Memory switch setting

[Function]　　Specify the right space amount of ANK characters in n dots.

　　　　　Standard mode and page mode can be set independently of each other.

　　　　　The ANK character width is "left space amount" + "ANK font dot count" + "right space amount."

ESC & c1 c2 n d1 … d48

[Name]	Register ANK font download characters	

[Code]
ASCII	ESC	&	c1	c2	n	d1 ⋯ d48	
HEX	1B	26	c1	c2	n	d1 ⋯ d48	
DEC	27	38	c1	c2	n	d1 ⋯ d48	

[Defined Area]   c1=1, 49

c2=1, 49

$32 \leq n \leq 127$

$0 \leq d \leq 255$

[Initial Value]   ---

[Function]   Register ANK font characters to the nth address.

Download characters can be registered to <20>H to <7F>H.

If one has been already registered to an address, it is overwritten.

When parameters c1 and c2 n are outside of the defined area, subsequent data is handled as normal data.

<Example Font-A>

●: Font data   ○: Invalid data
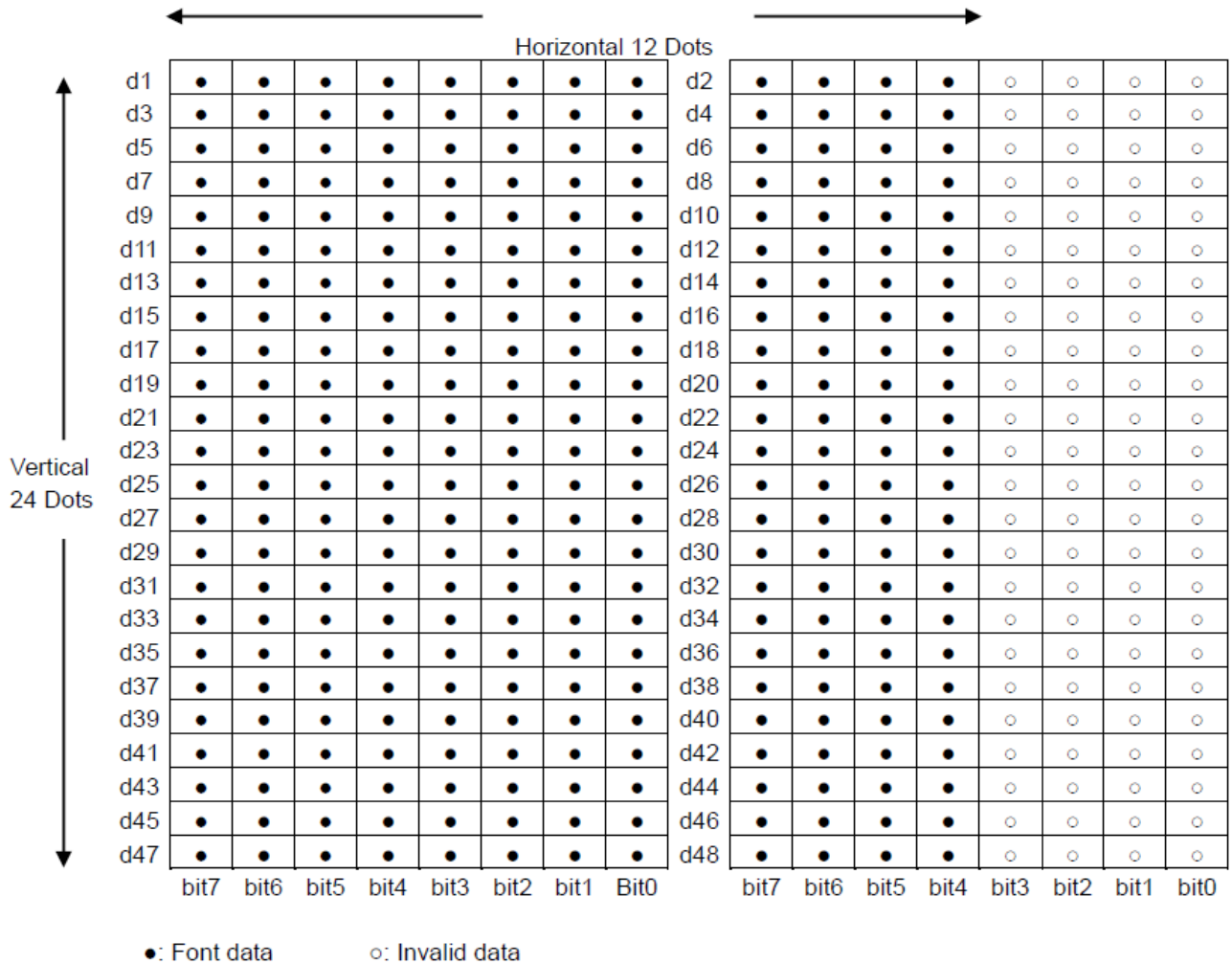
ESC & c1 c2 n

[Name]   Delete ANK font download characters

[Code]   ASCII   ESC   &   c1   c2   n

            HEX   1B   26 c1   c2   n

            DEC   27   38 c1   c2   n

[Defined Area] $c1=1, 49$

               $c2=0, 48$

               $32 \leq n \leq 127$

[Initial Value]   ---

[Function]   Deletes ANK font download characters registered to the nth address.

ESC % n

[Name]   Specify/cancel ANK download characters

[Code]   ASCII ESC   %   n

            HEX   1B   25   n

            DEC   27   37   n

[Defined Area] $n=0, 1, 48, 49$

[Function]   Specify/cancel ANK download characters.

n	Contents
0, 48	Cancels ANK download characters
1, 49	Specifies ANK download characters

〈Print example of ANK download characters〉

1. ANK download character register (ESC & c1 c2 n d1 ··· d48)

2. Specify ANK download characters (ESC 1 n(n=1))

3. Prints ANK download characters

ESC i n1 n2

[Name]   Specify/cancel the double wide and high

[Code]   ASCII   ESC   i   n1   n2

               HEX   1B   69   n1   n2

               DEC   27   105   n1   n2

[Defined Area] $0 \leq n1 \leq 5$, $48 \leq n1 \leq 53$

               $0 \leq n2 \leq 5$, $48 \leq n2 \leq 53$

[Initial Value]   n1=0, n2=0

[Function]   Specifies/cancels double high/wide for ANK characters

            This command is ignored if either n1 or n2 is outside of the defined area.

n1	Contents
0, 48	Cancels expanded high
1, 49	Specifies 2x high expansion
2, 50	Specifies 3x high expansion
3, 51	Specifies 4x high expansion
4, 52	Specifies 5x high expansion
5, 53	Specifies 6x high expansion

n2	Contents
0, 48	Cancels expanded wide
1, 49	Specifies 2x wide expansion
2, 50	Specifies 3x wide expansion
3, 51	Specifies 4x wide expansion
4, 52	Specifies 5x wide expansion
5, 53	Specifies 6x wide expansion

ESC W n

[Name]   Specify/cancel expanded wide

[Code]   ASCII   ESC   W   n

               HEX   1B   57   n

               DEC   27   87   n

[Defined Area] $0 \leq n \leq 5$, $48 \leq n \leq 53$

[Initial Value]   n=0

[Function]   Specifies/cancels double wide for ANK characters

n	Contents
0, 48	Cancels expanded wide
1, 49	Specifies 2x wide expansion
2, 50	Specifies 3x wide expansion
3, 51	Specifies 4x wide expansion
4, 52	Specifies 5x wide expansion
5, 53	Specifies 6x wide expansion

ESC h n

[Name]   Specify/cancel expanded high

[Code]   ASCII   ESC   h   n

              HEX   1B   68   n

              DEC   27   104   n

[Defined Area] $0 \leq n \leq 5$, $48 \leq n \leq 53$

[Initial Value]   n=0

[Function]   Specifies/cancels double high for ANK characters

n	Contents
0, 48	Cancels expanded high
1, 49	Specifies 2x high expansion
2, 50	Specifies 3x high expansion
3, 51	Specifies 4x high expansion
4, 52	Specifies 5x high expansion
5, 53	Specifies 6x high expansion

ESC E

[Name]   Select emphasized printing

[Code]   ASCII   ESC   E

              HEX   1B   45

              DEC   27   69

[Function]   Specifies emphasized printing for ANK characters.

              IBM block ignores emphasized printing.

ESC F

[Name]   Cancel emphasized printing

[Code]   ASCII   ESC   F

              HEX   1B   46

              DEC   27   70

[Function]   Cancels emphasized printing for ANK characters.

ESC − n

[Name]   Specify/cancel underling mode

[Code]   ASCII   ESC   −   n
          HEX   1B   2D   n
          DEC   27   45   n

[Defined Area]   n=0, 1, 48, 49

[Initial Value]   n=0

[Function]   Specifies underlining (2 dots).

        Underlines are composed of 2 dot lines.

        Underlines are not applied to horizontal tabs and to specified horizontal direction positions.

        Underlines are expanded if the character expansion is specified.

        (When double high expansion is used, underlines are composed of 4 dots.)

        Underlines are enabled for white/black inversion.

        This command is enabled for ANK characters.

        IBM block ignores underlines.

n	Contents
0, 48	Cancels underline
1, 49	Specifies underline

ESC _ n

[Name]   Specify/Cancel upperline

[Code]   ASCII   ESC   _   n
          HEX   1B   5F   n
          DEC   27   95   n

[Defined Area]   n=0, 1, 48, 49

[Initial Value]   n=0

[Function]   Specifies upperlining (2 dots).

        Upperlines are composed of 2 dot lines.

        Upperlines are not applied to horizontal tabs and to specified horizontal direction positions.

        Upperlines are expanded if the character expansion is specified.

        (When double high expansion is used, upperlines are composed of 4 dots.)

        Upperlines are enabled for white/black inversion.

        This command is enabled for ANK characters.

        IBM block ignores upperlines.

n	Contents
0, 48	Cancels upperline
1, 49	Specifies upperline

ESC 4

[Name]　　Select white/black inverted printing

[Code]　　ASCII　ESC　　4

　　　　　HEX　　1B　　34

　　　　　DEC　　27　　52

[Function]　　Specifies white/black inversion for ANK characters.

　　　　　　IBM block ignores white/black inversion.

ESC 5

[Name]　　Cancel white/black inversion

[Code]　　ASCII　ESC　　5

　　　　　HEX　　1B　　35

　　　　　DEC　　27　　53

[Function]　　Cancels white/black inversion for ANK characters.

SI

[Name]   Select upside-down printing

[Code]   ASCII   SI

               HEX   0F

               DEC   15

[Function]   Specifies upside-down printing.

               This command is enabled only when at the top of the line.

               Upside down and right-side up characters cannot both exist in the same line.

               This command is enabled for following.

                    ANK characters

                    Bit images

                    Logos

                    Bar codes

DC2

[Name]   Cancel upside-down printing

[Code]   ASCII   DC2

               HEX   12

               DEC   18

[Function]   Cancels upside-down printing

               This command is enabled only when at the top of the line.

ESC l n

[Name]   Set left margin

[Code]   ASCII   ESC   l   n

            HEX   1B   6C   n

            DEC   27   108 n

[Defined Area]   0≤n≤255

[Initial Value]   n=0

[Function]   Uses the left edge as a standard to set the left margin as (current ANK character pitch xn).

                    Character pitch includes the space between characters and expansion settings are enabled.

                    The left margin set using this command is unaffected by changing the character pitch.

                    This command is ignored if settings are for a printing region less than 36 mm.

                    Setting this command partway will take affect from the next line.

ESC Q n

[Name]   Set right margin

[Code]   ASCII   ESC   Q   n

            HEX   1B   51   n

            DEC   27   81   n

[Defined Area]   0≤n≤255

[Initial Value]   Memory switch setting

[Function]   Uses the left edge as a standard to set the print region as (current ANK character pitch xn).

                    Character pitch includes the space between characters and expansion settings are enabled.

                    The right margin set using this command is unaffected by changing the character pitch.

                    This command is ignored if settings are for a printing region less than 36 mm.

                    Setting this command partway will take affect from the next line.
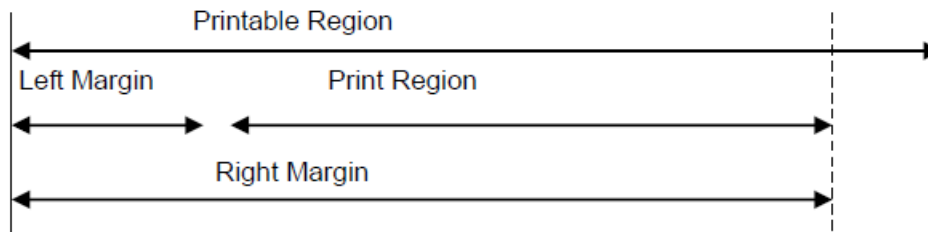
HT

[Name]   Move horizontal tab

[Code]   ASCII   HT

            HEX   09

            DEC   9

[Function]   Move print position to next horizontal tab position.

                This command is ignored with under the following conditions.

                    When there is no horizontal tab set.

                    When the current position is the same as the furthest right horizontal tab position or to the right of it.

ESC D n1 n2 ... nk NUL

[Name] Set horizontal tab·

[Code] ASCII ESC D n1 n2 ··· nk NUL

     HEX 1B 44 n1 n2 ··· nk 00

     DEC 27 68 n1 n2 ··· nk 0

[Defined Area] $1 \leq n \leq 255$

      $0 \leq k \leq 16$

[Initial Value] ———

[Function] Uses the left edge as a standard to set the horizontal tab to the position of (current ANK character pitch×n).

    The horizontal tab reference point is the right edge of the paper, regardless of the left margin.

    ANK character pitch includes the right space and expansion settings are enabled.

    All other horizontal tabs set before setting the horizontal tab using this command are cancelled.

    A maximum of 16 horizontal tabs can be set. However, the tab position must satisfy the following conditions.

    If the following conditions are not met, data up to the NUL code is discarded.

    Normal tabs that meet the conditions below are set and tabs after errors occur are not set.

      $1 < n1 < n2 \cdots < nk$

      $nk \leq$ Printable region

    The horizontal tab set using this command is unaffected by changing the character pitch.

    Horizontal tabs set using the ESC D NUL command are cleared.

    Standard mode and page mode can be set independently of each other.

ESC GS A n1 n2

[Name] Move absolute position

[Code] ASCII ESC GS A n1 n2

   HEX 1B 1D 41 n1 n2

   DEC 27 29 65 n1 n2

[Defined Area] 0≤n1≤255, 0≤n2≤255

[Initial Value] ---

[Function] Moves the printing position from the left margin to the (n1+n2x256) dots position

This command is ignored if the print region is exceeded.

If print data is overlapped when moved to the left, the old print data is overwritten by new data

(that is, only the portion overlapped by the new data is lost).

ESC GS R n1 n2

[Name] Move relative position

[Code] ASCII ESC GS R n1 n2

   HEX 1B 1D 52 n1 n2

   DEC 27 29 82 n1 n2

[Defined Area] 0≤n1≤255, 0≤n2≤255

[Initial Value] ---

[Function] Moves the printing position from current position to the (n1+n2x256) dots position.

This command is ignored if the print region is exceeded.

When (n1 + n2 x 256) ≥ 32768, it moves {65536 − (n1 + n2x 256)} dots in the left direction.

When (n1 + n2 x 256) < 32768, it moves (n1 + n2 x 256) dots in the right direction.

If print data is overlapped when moved to the left, the old print data is overwritten by new data

(that is, only the portion overlapped by the new data is lost).

ESC GS a n

[Name] Specify position alignment

[Code] ASCII ESC GS a n

   HEX 1B 1D 61 n

   DEC 27 29 97 n

[Defined Area] 0≤n2≤2, 48≤n≤50

[Initial Value] n=0

[Function] Specifies the alignment position in the printing region that has been set.

n	Contents
0, 48	Left alignment
1, 49	Center alignment
2, 50	Right alignment

LF

[Name]   Line feed
[Code]   ASCII   LF
           HEX   0A
           DEC   10
[Function]   Feeds the currently specified amount of paper.
             If print data exists in the line buffer, it prints that data.
             The initial value for the amount of paper is set according to the memory switch settings.

ESC a n

[Name]   Feed paper n lines
[Code]   ASCII   ESC   a   n
           HEX   1B   61   n
           DEC   27   97   n
[Defined Area]   1≤n≤127
[Initial Value]   Memory switch setting
[Function]   Executes a paper feed for (the current specified line feed amount xn).
             If print data exists in the line buffer, it prints that data.
             The initial value for the amount of paper is set according to the memory switch settings.

ESC z n

[Name]   Specify line feed amount
[Code]   ASCII   ESC   z   n
           HEX   1B   7A   n
           DEC   27   122   n
[Defined Area]   0≤n≤1, 48≤n≤49
[Initial Value]   n=0
[Function]   Specified the line feed amount.
             Standard mode and page mode can be set independently of each other.

n	Contents
0, 48	Specifies 3mm line feed amount
1, 49	Specifies 4mm line feed amount

ESC 0

[Name]   Specify line spacing to 3mm
[Code]   ASCII   ESC   0
           HEX   1B   30
           DEC   27   48
[Function]   Specifies the line fee amount to 3mm.
             Standard mode and page mode can be set independently of each other.

ESC J n

[Name]　　n/4mm line feed

[Code]　　ASCII　ESC　　J　n

　　　　　HEX　　1B　　4A　n

　　　　　DEC　　27　　74　n

[Defined Area]　　1≤n≤255

[Function]　Executes a n/4mm paper feed.

　　　　　If print data exists in the line buffer, it prints that data.

　　　　　Using this command will intermittently feed paper, therefore, it is normally recommended that this command not be used.

ESC I n

[Name]　　n/8mm line feed

[Code]　　ASCII　ESC　　I　n

　　　　　HEX　　1B　　49　n

　　　　　DEC　　27　　73　n

[Defined Area]　　1≤n≤255

[Function]　Executes a n/8mm paper feed.

　　　　　If print data exists in the line buffer, it prints that data.

　　　　　Using this command will intermittently feed paper, therefore, it is normally recommended that this command not be used.

FF

[Name]   Form feed

[Code]   ASCII   FF

          HEX   0C

          DEC   12

[Function]   Executes a form feed.

If the current position is at the top of the page, it executes a form feed to the top of the next page.

If there is data existing in the line buffer when executing a form feed, it prints that data, then executes the form feed.

However, by printing data remaining in the buffer, and moving to the top of the next page, a form feed is considered to have been executed, so form feed is not performed.

Invalid in page mode.

ESC C n

[Name]   Specify page length to n lines

[Code]   ASCII   ESC   C   n

          HEX   1B   43   n

          DEC   27   67   n

[Defined Area] $1 \leq n \leq 127$

[Initial Value]   n=42

[Function]   The position whereat this command is processed is considered the top of the page and sets the page length to (current form feed amount x n).

The page length set using this command is unaffected by changing the form feed amount later.

Moving to the top of the page is performed using the following commands.

    Form feed command (FF)

    Cutter command (ESC d n)

    Error cancel operations

Invalid in black mark's valid.

ESC d n

[Name]   Auto-cutter

[Code]   ASCII   ESC   d   n

             HEX   1B   64   n

             DEC   27   100   n

[Defined Area]   0≤n≤3, 48≤n≤51

[Function]   Executes the auto-cutter.

After auto-cutter is executed, the printer considers that to be the top of the page.

If there is data existing in the line buffer, it prints that data, then executes the auto-cutter.

n	Contents
0, 48	Full cut at the current position. Print data in line buffer is printed before a full cut.
1, 49	Partial cut at the current position. Print data in line buffer is printed before a full cut.
2, 50	Paper is fed to cutting position, then a full cut Print data in line buffer is printed before the operation described above.
3, 51	Paper is fed to cutting position, then a partial cut Print data in line buffer is printed before the operation described above.

When presenter is connected, cutting is executed by changing the partial-cut to full-cut.

ESC GS P 0

[Name]   Selects page mode

[Code]   ASCII   ESC   GS   P   0

               HEX   1B   1D   50   30

               DEC   27   29   80   48

[Function]   Switches from standard mode to page mode.

              Valid only when input at the top of the line.

              Invalid when input in page mode.

              Returns to standard mode after running this command.

                  ·ESC GS P 1 (selects standard mode)

                  ·ESC GS P 7 (prints in page mode and recovers)

              The character expansion position uses the starting point specified by ESC GS P2 (selection of character print direction in page mode) in the print region specified by ESC GS P 3 (set print region in page mode).

              Switches the following command setting values to the setting values of page mode.

                  ·Set space amount: ESC SP, ESC s , ESC t

                  ·Set the line feed amount: ESC z , ESC 0

                  ·Set horizontal tab: ESC D

              The following commands are valid in page mode.

                  ·ESC GS a (Move absolute position)

                  ·SI (Select upside-down printing)

                  ·ESC l (Set left margin)

                  ·ESC Q (Set right margin)

              The following commands are invalid in page mode.

                 FF (Form feed)

                 ESC RS m (BM setting)

                 ESC RS A (Printing Region Setting)

               Recover to standard mode using ESC @ (initialize printer)

ESC GS P 1

[Name]   Cancel page mode

[Code]   ASCII   ESC   GS   P   1

           HEX   1B   1D   50   31

           DEC   27   29   80   49

[Function]   Cancel page mode.

Valid only when input in page mode.

Data expanded in page mode is erased.

After execution, the top of the line is positioned at the next print starting position.

Print region set by ESC GS P 3 (Set print region in page mode) is initialized.

Switches the following command setting values to the setting values of standard mode.

   ·Set space amount: ESC SP, ESC s , ESC t

   ·Set the line feed amount: ESC z , ESC 0

   ·Set horizontal tab: ESC D

The following commands are valid only when set in standard mode.

   ·ESC GS P 3 (Set print region in page mode)

   ·ESC GS P 2 (Select character print direction in page mode.)

The following commands are ignored in standard mode.

   ·ESC GS P 4 (Specify character vertical direction absolute position in page mode)

   ·ESC GS P 5 (Specify character vertical direction relative position in page mode.)

   ·ESC GS P 6 (Print data in page mode.)

   ·ESC GS P 7 (Print in page mode and recover)

   ·ESC GS P 8 (Cancel print data in page mode.)

When power is turned on and when a reset is implemented, standard mode is selected when executing initialization (ESC @) of the printer.

ESC GS P 2 n

[Name]   Select character print direction in page mode

[Code]   ASCII   ESC   GS   P   2   n

           HEX   1B   1D   50   32   n

           DEC   27   29   80   50   n

[Defined Area] $0 \leq n \leq 3$, $48 \leq n \leq 51$

[Initial Value]   n = 0

[Function]   Select character print direction and starting point in page mode.

n	Printing Direction	Starting Point
0, 48	Left to Right	Upper Left (Drawing at Right A)
1, 49	Bottom to Top	Bottom Left (Drawing at Right B)
2, 50	Right to Left	Bottom Right (Drawing at Right C)
3, 51	Top to Bottom	Top Right (Drawing at Right D)
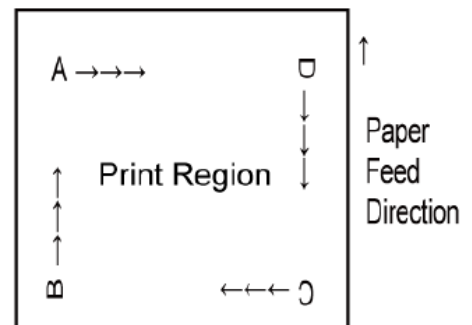
When standard mode is selected, only internal printer flag operations are executed when this command is entered.

The starting point in the print region specified by ESC GS P 3 (Set print region in page mode) is used for the start of character expansion.

ESC GS P 3 xL xH yL yH dxL dxH dyL dyH

[Name]　　　Set print region in page mode

[Code]　　　ASCII　ESC　GS　P　3　xL　xH　yL　yH　dxL　dxH　dyL　dyH

　　　　　　　HEX　　1B　1D　50　33　xL　xH　yL　yH　dxL　dxH　dyL　dyH

　　　　　　　DEC　　27　29　80　51　xL　xH　yL　yH　dxL　dxH　dyL　dyH

[Defined Area]　0≤xL, xH, yL, yH, dxL, dxH, dyL, dyH≤255

[Initial Value]　xL = xH = yL = yH = 0

　　　　　　　　dxL, dxH, dyL, dyH (See the table below)

[Function]　　Set print region in page mode.

　　　　　　　Sets the position and size of the print region.

　　　　　　　　·Horizontal starting point = [(xL+xH x 256) x 1/8] mm

　　　　　　　　·Vertical starting point = [(yL+yH x 256) x 1/8] mm

　　　　　　　　·Horizontal direction length = [(dxL+dxH x 256) x 1/8] mm

　　　　　　　　·Vertical direction length = [(dyL+dyH x 256) x 1/8] mm

　　　　　　When standard mode is selected, only internal printer flag operations are executed when this command is entered. Has no effect on printing.

　　　　　　If the horizontal or vertical starting point is outside of the print region, invalidate all settings.

　　　　　　If the horizontal or vertical length direction is 0, invalidate all settings.

　　　　　　The character expansion stating point is the one specified by the selection of the character printing direction (ESC GS P 2) in page mode in the print region.

　　　　　　If the (horizontal direction starting point + horizontal direction length) exceeds the horizontal direction printable region, the (horizontal direction printable region − horizontal direction starting point) becomes the horizontal direction length.

　　　　　　If the (vertical direction starting point + vertical direction length) exceeds the vertical direction printable region, the (vertical direction printable region − vertical direction starting point) becomes the vertical direction length.

　　　　　　If the calculated results is a fraction, that is corrected to the minimum mechanical pitch and excess is discarded.

ESC GS P 4 nL nH

[Name]　　　Specify character vertical direction absolute position in page mode

[Code]　　　ASCII　ESC　GS　P　4　nL　nH

　　　　　　　HEX　　1B　1D　50　34　nL　nH

　　　　　　　DEC　　27　29　80　52　nL　nH

[Defined Area]　0≤ nL, nH ≤255

[Function]　　Specify the position for character vertical direction of the data expansion starting position in page mode with the absolute position that uses the starting point as a reference.

　　　　　　The position of the character vertical direction of the starting position for subsequent data expansion uses the position from the starting point [(nL + nH x 256) x 1/8] mm.

　　　　　　This command is ignored when page mode is not selected.

　　　　　　Absolute position specifications that exceed the specified print region are ignored.

　　　　　　The position of the character horizontal direction of the data expansion starting position does not move.

　　　　　　Specify the reference starting point using ESC GS P 2.

　　　　　　The following operations will occur depending on the starting point of ESC GS P 2 command.

　　　　　　　a. When the starting point is "upper left" or "bottom right," specify the absolute position of the paper feed direction.

　　　　　　　b. When the starting point is "upper right" or "bottom left," specify the absolute position of the perpendicular direction to the paper feed.

　　　　　　If the calculated result is a fraction, that is corrected to the minimum mechanical pitch and excess is discarded.

ESC GS P 5 nL nH

[Name]   Specify character vertical direction relative position in page mode

[Code]

	ASCII	ESC	GS	P	5	nL	nH
	HEX	1B	1D	50	35	nL	nH
	DEC	27	29	80	53	nL	nH

[Defined Area] $0 \leq$ nL, nH ≤ 255

[Function]   Specify the position for character vertical direction of the data expansion starting position in page mode with the relative position that uses the current position as a reference.

The subsequent data expansion starting position uses the position moved $[(nL + nH \times 256) \times 1/8]$ mm from the current position.

This command is ignored when page mode is not selected.

When specifying the characters downward from the current position the value is positive (plus);

when specifying upward, the value is negative (minus).

Negative numbers are represented by a complement of 65536. For example, use the following to move upward N pitches.

   nL +H x 256 = 65536 − N

Relative position specifications that exceed the specified print region are ignored.

The following operations will occur depending on the ESC GS P 2 command.

     a. When the starting point is "upper left" or "bottom right," specify the relative position of the paper feed direction.

     b. When the starting point is "upper right" or "bottom left", specify the relative position of the perpendicular direction to the paper feed.

If the calculated result is a fraction, that is corrected to the minimum mechanical pitch and excess is discarded.

ESC GS P 6

[Name]   Print data in page mode

[Code]

	ASCII	ESC	GS	P	6
	HEX	1B	1D	50	36
	DEC	27	29	80	54

[Function]   Lump-prints data expanded to the entire print region in page mode.

Valid only when page mode is selected.

After printing, the following information is maintained.

     a. Expanded data

     b. Selection of character print direction in page mode (ESC GS P 2)

     c. Setting of print region in page mode (ESC GS P 3)

     d. Character expansion position

ESC GS P 7

[Name]　　　Print in page mode and recover

[Code]　　　ASCII　ESC　　GS　　P　　7

　　　　　　　HEX　　1B　　1D　　50　　37

　　　　　　　DEC　　27　　29　　80　　55

[Function]　Lump-prints data expanded to the entire print region and recovers to standard mode.

　　　　　　Valid only when page mode is selected.

　　　　　　All expanded data is erased after printing.

　　　　　　Print region set by ESC GS P 3 (Set print region in page mode) is initialized.

　　　　　　No paper cut is executed.

　　　　　　After execution, the top of the line is positioned at the next print starting position.

ESC GS P 8

[Name]　　　Cancel print data in page mode

[Code]　　　ASCII　ESC　　GS　　P　　8

　　　　　　　HEX　　1B　　1D　　50　　38

　　　　　　　DEC　　27　　29　　80　　56

[Function]　Erases all data in presently set print region, in page mode.

　　　　　　Valid only when page mode is selected.

　　　　　　Portion included in the currently set print region is deleted even if data of the print region set previously.

ESC K n1 n2 d1···dk

[Name]　　　Standard density bit image

[Code]　　　ASCII　　ESC　　K　　n1　　n2　　d1　···　dk

　　　　　　　HEX　　　1B　　4B　　n1　　n2　　d1　···　dk

　　　　　　　DEC　　　27　　75　　n1　　n2　　d1　···　dk

[Defined Area]　　　$1 \leq \{(n1 + n2 \times 256) \times 3\} \leq$ Printable region

　　　　　　　　　　$k = (n1 + n2 \times 256)$

　　　　　　　　　　$0 \leq d \leq 255$

　　　　　　　　　　$0 \leq n1, n2 \leq 255$

[Function]　　　Prints bit images using 3 dots wide and 3 dots high per 1dot of input data.

　　　　　　　The following shows the data processing in this command.

　　　　　　　·When $\{(n1 + n2 \times 256) \times 3\}$ exceeds the printable region that is currently set, only the data in the printing

　　　　　　　　region is printed. At this time, all data for the print region is discarded.

　　　　　　　· If the current position already exceeds the print region, this command discards all data.
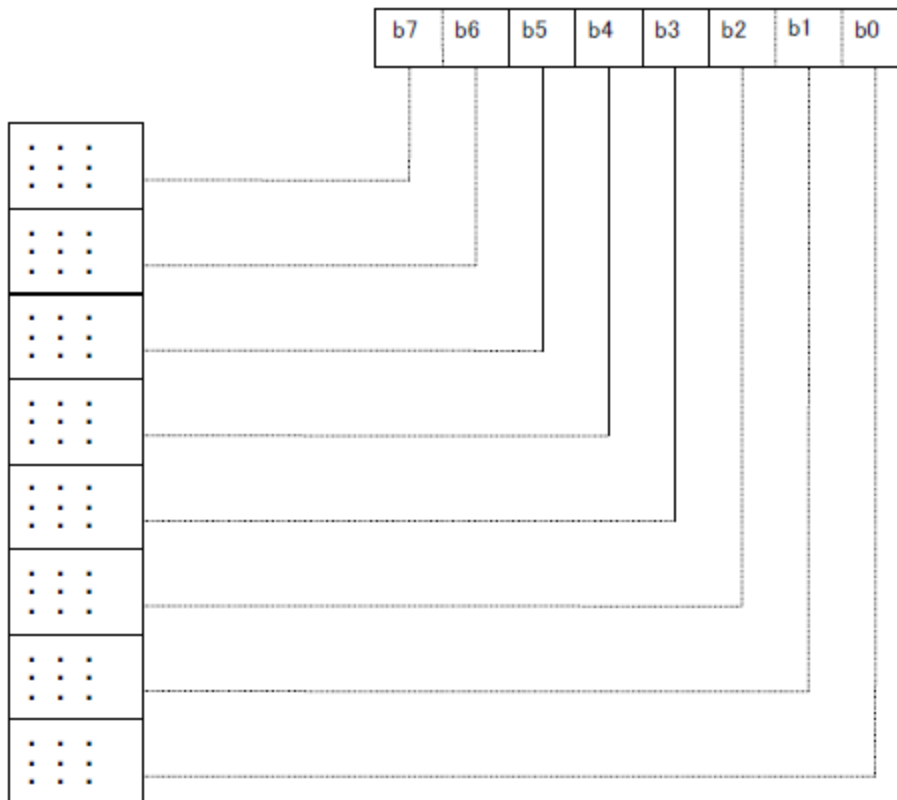
ESC L n1 n2 d1···dk

[Name]   Standard density bit image

[Code]   ASCII   ESC   L   n1   n2   d1 ··· dk

                HEX   1B   4C   n1   n2   d1 ··· dk

                DEC   27   76   n1   n2   d1 ··· dk

[Defined Area] $1 \leq (n1 + n2 \times 256) \leq$ Printable region

                $k = (n1 + n2 \times 256)$

                $0 \leq d \leq 255$

                $0 \leq n1, n2 \leq 255$

[Function]   Prints bit images using 1dot wide and 3 dots high per 1dot of input data.

                The following shows the data processing in this command.

                ·When {(n1 + n2 x 256) x 3} exceeds the printable region that is currently set, only the data in the printing

                 region is printed. At this time, all data for the print region is discarded.

                · If the current position already exceeds the print region, this command discards all data.
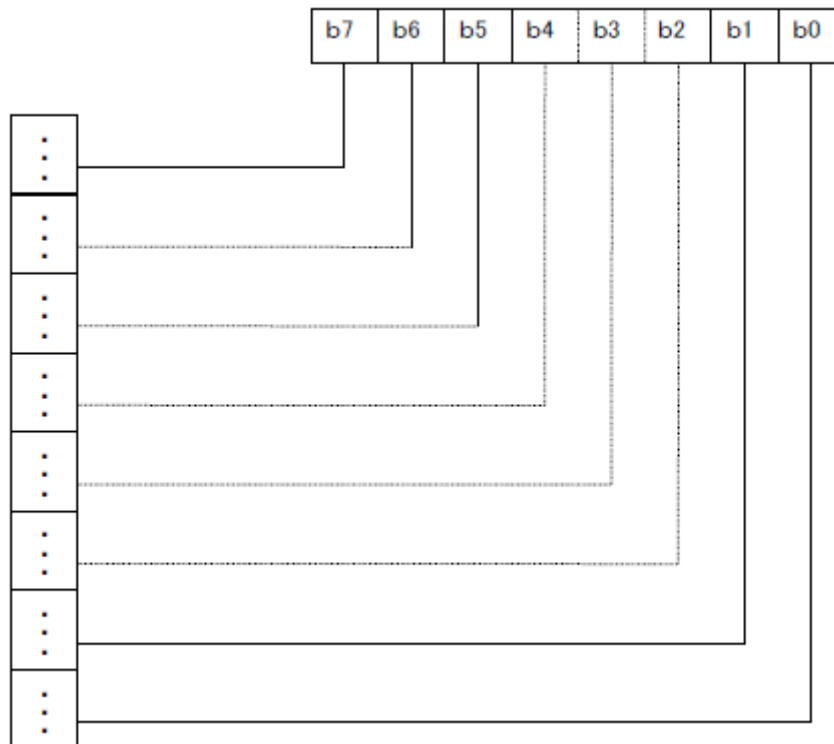
ESC k n1 n2 d1···dk

[Name]　　Fine density bit image

[Code]　ASCII　　ESC　　k　　n1　　n2　　d1 ··· dk

　　　　　HEX　　　1B　　6B　　n1　　n2　　d1 ··· dk

　　　　　DEC　　　27　　107　n1　　n2　　d1 ··· dk

[Defined Area]　$1 \leq (n1 + n2 \times 256) \leq$ Printable region

　　　　　　　　$k = \{(n1 + n2 \times 256) \times 24\}$

　　　　　　　　$0 \leq d \leq 255$

　　　　　　　　$0 \leq n1, n2 \leq 255$

[Function]　　Prints bit images using 1 dot wide and 1 dot high per 1dot of input data.

　　　　　　　The following shows the data processing in this command.

　　　　　　　·When $\{(n1 + n2 \times 256) \times 3\}$ exceeds the printable region that is currently set, only the data in the printing

　　　　　　　　region is printed. At this time, all data for the print region is discarded.

　　　　　　　· If the current position already exceeds the print region, this command discards all data.

X byte = (n1 + n2 x 256)

	d1	d2	··················	dX
	dX x 1 + 1	dX x 1 + 2	··················	dX x 2
24dot	dX x 2 + 1	dX x 2 + 2	··················	dX x 3
	:	:		:
	:	:		:
	dX x 23 + 1	dX x 23 + 2	··················	dX x 24

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
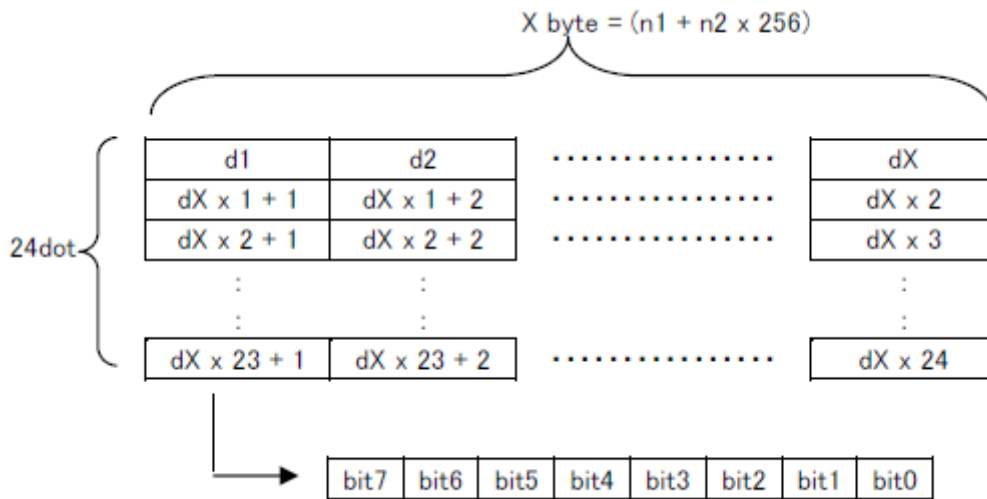
ESC X n1 n2 d1···dk

[Name]   Fine density bit image (Compatible with 24bit wire dots)

[Code]   ASCII   ESC   X   n1   n2   d1 ··· dk

           HEX   1B   58   n1   n2   d1 ··· dk

           DEC   27   88   n1   n2   d1 ··· dk

[Defined Area] $1 \leq (n1 + n2 \times 256) \leq$ Printable region

                   $k = \{(n1 + n2 \times 256) \times 3\}$

                   $0 \leq d \leq 255$

                   $0 \leq n1, n2 \leq 255$

[Function]   Prints input bit images with 8 dots/mm resolution for both horizontal and vertical.

           The following shows the data processing in this command.

          ·When $\{(n1 + n2 \times 256) \times 3\}$ exceeds the printable region that is currently set, only the data in the printing

            region is printed. At this time, all data for the print region is discarded.

          · If the current position already exceeds the print region, this command discards all data.
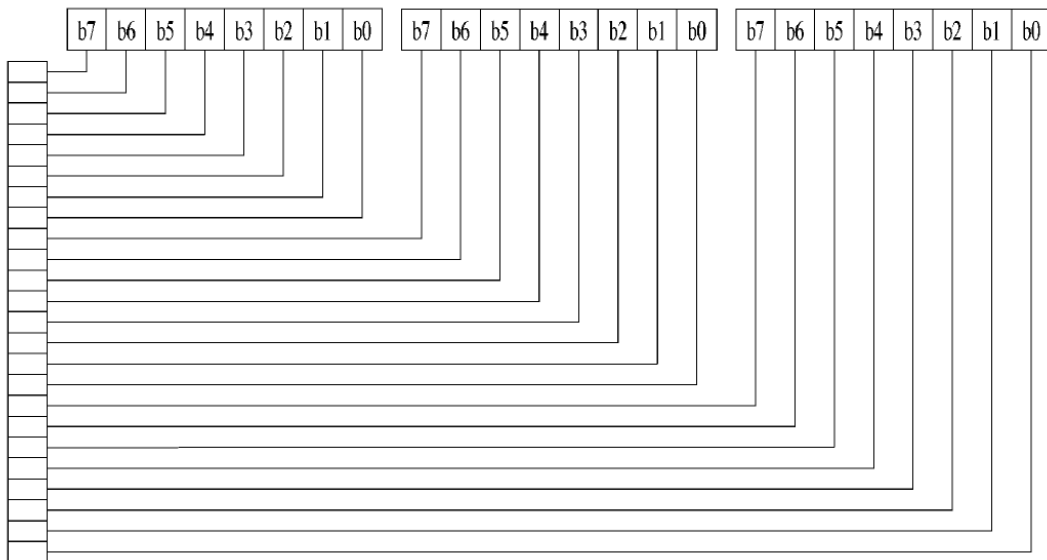
ESC GS S m xL xH yL yH n [d11 d12 ⋯ d1k]

[Name]   Print raster graphics data

[Code]   ASCII   ESC   GS   S   m   xL   xH   yL   yH   n d11 d12 ⋯ d1k

           HEX   1B   1D   53   m   xL   xH   yL   yH   n d11 d12 ⋯ d1k

           DEC   27   29   83   m   xL   xH   yL   yH   n d11 d12 ⋯ d1k

[Defined Area]   m= 1 n=0

                $0 \leq xL \leq 255$, $0 \leq xH \leq 1$, $0 \leq yL \leq 255$, $0 \leq yH \leq 255$

                $1 \leq (xL + xH \times 256) \leq 128$

                $1 \leq (yL + yH \times 256) \leq 65535$

                $0 \leq d \leq 255$

                $k = (xL + xH \times 256) \times (yL + yH \times 256)$

[Function]   Print raster graphics data.

             Specify only the 2 tones Monochrome printing regardless of input m parameter.

             Disabled in Page Mode.

             $(xL + xH \times 256)$ specifies the number of horizontal data bytes ((a number of dots x a number of bits per dot)/8,

             +1 if not divisible).

             $(yL + yH \times 256)$ specifies the number of dots in the vertical direction.

             k indicates the number of the data.

             $(d1, d2 ⋯ dk)$ specifies the image data to define.

             When parameter is disabled:

               ·parameter m: Command processing end (ESC GS S m).

               ·parameter n: n=0

               ·parameter xL, xH, yL, yH: Command processing end (ESC GS S m xL xH yL yH)

ESC GS (L pL pH m fn [parameter]

ESC GS 8 L p1 p2 p3 p4 m fn [parameter]

[Name]   Specify graphics data

[Code]   ASCII   ESC GS   (L   pL   pH   m fn   [parameter]

           HEX   1B   1D   28   4C   pL   pH   m fn   [parameter]

           DEC   27   29   40   76   pL   pH   m fn   [parameter]

[Name]   Specify graphics data

[Code]   ASCII   ESC GS   8   L   p1   p2   p3   p4   m   fn   [parameter]

           HEX   1B   1D   38   4C   p1   p2   p3   p4   m   fn   [parameter]

           DEC   27   29   56   76   p1   p2   p3   p4   m   fn   [parameter]

(✳) Use the ESC GS (L code to explain each function.

・ESC GS (L and ESC GS 8 L are the same function.

・If [parameter] in each function exceeds 65533 bytes, use ESC GS 8 L.

[Function]   Runs the process related to the graphics data specified by the function code (fn).

fn	Code	Function No	Function
0, 48	ESC GS (L pL pH m fn	48	Send NV graphics memory capacity
3, 51	ESC GS (L pL pH m fn	51	Send remaining NV Graphics memory capacity
64	ESC GS (L pL pH m fn d1 d2	64	Send NV graphics key code
65	ESC GS (L pL pH m fn d1 d2 d3	65	Batch all delete NV graphics data
66	ESC GS (L pL pH m fn kc1 kc2	66	Delete the specified NV graphics data
67	ESC GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1···dk]1 [c d1···dk]b	67	Define NV graphics data
69	ESC GS (L pL pH m fn kc1 kc2 x y	69	Print the specified NV graphics data

\<Function 48\>ESC GS (L pL pH m fn (fn=48)

\<Function 48\>ESC GS 8 L p1 p2 p3 p4 m fn (fn=48)

[Name]   Send NV graphics memory capacity

[Code]

	ASCII	ESC	GS	(	L	pL	pH	m	fn
	HEX	1B	1D	28	4C	pL	pH	m	fn
	DEC	27	29	40	76	pL	pH	m	fn

[Code]

	ASCII	ESC	GS	8	L	p1	p2	p3	p4	m	fn
	HEX	1B	1D	38	4C	p1	p2	p3	p4	m	fn
	DEC	27	29	56	76	p1	p2	p3	p4	m	fn

[Defined Area]   ·Parameter for ESC GS (L

       (pL + pH x 256) = 2 (pL=2, pH=0)

     ·Parameter for ESC GS 8 L

       (p1 + p2 x 256+p3 x 65536+p4 x 16777216) = 2 (p1=2, p2=0, p3=0, p4=0)

     ·Parameter are shared by ESC GS (L and ESC GS 8 L

       m = 48

       fn = 0, 48

[Function]   Sends the entire capacity of NV graphics area in bytes.

[Details]   The byte count is sent in the following format:

Transmission data	Hex	Dec	Data length
Header	\<37\>H	55	1Byte
Identifier	\<30\>H	48	1Byte
Total capacity *1	\<30\>H to \<39\>H	48 to 57	1 to 8Byte
NUL	00	0	1Byte

    *1. The total capacity is the total number of bytes in this region.

    The decimal value indicating the total capacity is converted to text data and sent in order from the MSB.

    Ex.: When the total capacity is 1200 bytes:

      "1200" (Hex:31H, 32H, 30H, 30H, Decimal:49, 50, 48, 48) is converted to 4-bytes of data.

· This command is used when sending total capacity, and the total byte capacity of the region is sent regardless

  of the current setting for the NV graphics data. This total capacity includes the information region.

· When the value that indicates the entire capacity is "0" (Hex:30H, Decimal:48), it is not possible to use the

  NV graphics function.

[Note]   ·Data transmission process : Function 48, 51, 64

      Observe the following rules when using these functions.

    · When the host PC sends this command, the printer sends response data or the status to the PC.

      The PC does not send any more data until it receives response data or status from the printer.

    · When the amount of data exceeds the capacity of the transmission buffer, data is erased.

    · Transmission information of each function can be identified as other transmission data by specific data

      (identifier) of the transmission data string.

      When the header sent by the printer is [Hex = 37H/Decimal = 55], data up to NUL

      [Hex = 00H/Decimal = 0] is handled as one group, and identified by corresponding to the combination of

      the header and identifier.

<Function 51>ESC GS (L pL pH m fn (fn=51)

<Function 51>ESC GS 8 L p1 p2 p3 p4 m fn (fn=51)

[Name]   Send NV graphics memory capacity

[Code]
	ASCII	ESC	GS	(	L	pL	pH	m	fn
	HEX	1B	1D	28	4C	pL	pH	m	fn
	DEC	27	29	40	76	pL	pH	m	fn

[Code]
	ASCII	ESC	GS	8	L	p1	p2	p3	p4	m	fn
	HEX	1B	1D	38	4C	p1	p2	p3	p4	m	fn
	DEC	27	29	56	76	p1	p2	p3	p4	m	fn

[Defined Area]   ·Parameter for ESC GS (L

$(pL + pH \times 256) = 2$ $(pL=2, pH=0)$

·Parameter for ESC GS 8 L

$(p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) = 2$ $(p1=2, p2=0, p3=0, p4=0)$

·Parameter are shared by ESC GS (L and ESC GS 8 L

m = 48

fn = 3, 51

[Function]   Sends the remaining capacity (or unused area) of the NV graphics area in bytes.

[Details]   ·Sends the number of bytes in the following format:

Transmission data	Hex	Dec	Data length
Header	<37>H	55	1Byte
Identifier	<30>H	48	1Byte
Total capacity *1	<30>H to <39>H	48 to 57	1 to 8Byte
NUL	00	0	1Byte

*1 The unused capacity is the total number of bytes of the unused region.

The decimal value indicating the unused capacity is converted to text data and sent in order from the MSB.

Ex.: When the unused capacity is 120 bytes:

"120" (Hex:31H, 32H, 30H, Decimal:49, 50, 48) is converted to 3-bytes of data.

· Information region is also included in the use capacity.

· See the Note for <Function 48> for a detailed explanation of the sending process.

\<Function 64\>ESC GS (L pL pH m fn d1 d2 (fn=64)

\<Function 64\>ESC GS 8 L p1 p2 p3 p4 m fn d1 d2 (fn=64)

[Name]   Send a key code list of predefined NV graphics

[Code]

	ASCII	ESC	GS	(	L	pL	pH	m	fn	d1	d2
	HEX	1B	1D	28	4C	pL	pH	m	fn	d1	d2
	DEC	27	29	40	76	pL	pH	m	fn	d1	d2

[Code]

	ASCII	ESC	GS	8	L	p1	p2	p3	p4	m	fn	d1	d2
	HEX	1B	1D	38	4C	p1	p2	p3	p4	m	fn	d1	d2
	DEC	27	29	56	76	p1	p2	p3	p4	m	fn	d1	d2

[Defined Area]   ·Parameter for ESC GS (L
      $(pL + pH \times 256) = 4$ (pL=4, pH=0)
    ·Parameter for ESC GS 8 L
      $(p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) = 4$ (p1=4, p2=0, p3=0, p4=0)
    ·Parameter are shared by ESC GS (L and ESC GS 8 L
      m = 48
      fn = 64
      d1 = 75, d2 = 67

[Function]   Sends the defined NV graphics key code list.

[Details]   ·Sends the key code in the following format:

Transmission data	Hex	Dec	Data length
Header	\<37\>H	55	1Byte
Identifier	\<72\>H	114	1Byte
Identifier information *1, *2	\<40\>H / \<41\>H	64 / 65	1Byte
Data	\<20\>H to \<7E\>H	32 to 126	2 to 80 Byte
NUL	00	0	1Byte

*1 Send one block with identification information (3rd byte) as 40Hex, when the defined NV graphics data count is less than 40.

*2 Send one block with identification information (3rd byte) as 41Hex, when the defined NV graphics data count is over 40.

· If there is no defined NV graphics key code list, it sends the following format.

Transmission data	Hex	Dec	Data length
Header	\<37\>H	55	1Byte
Identifier	\<72\>H	114	1Byte
Identifier information	\<40\>H	64	1Byte
NUL	00	0	1Byte

·See the Note for \<Function 48\> for a detailed explanation of the sending process.

＜Function 65＞ESC GS (L pL pH m fn d1 d2 d3 (fn=65)

＜Function 65＞ESC GS 8 L p1 p2 p3 p4 m fn d1 d2 d3 (fn=65)

[Name]   Erase entire NV graphics data

[Code]

ASCII	ESC	GS	(	L	pL	pH	m	fn	d1	d2	d3
HEX	1B	1D	28	4C	pL	pH	m	fn	d1	d2	d3
DEC	27	29	40	76	pL	pH	m	fn	d1	d2	d3

[Code]

ASCII	ESC	GS	8	L	p1	p2	p3	p4	m	fn	d1	d2	d3
HEX	1B	1D	38	4C	p1	p2	p3	p4	m	fn	d1	d2	d3
DEC	27	29	56	76	p1	p2	p3	p4	m	fn	d1	d2	d3

[Defined Area]   ・Parameter for ESC GS (L

   $(pL + pH \times 256) = 5$ (pL=5, pH=0)

   ・Parameter for ESC GS 8 L

   $(p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) = 5$ (p1=5, p2=0, p3=0, p4=0)

   ・Parameter are shared by ESC GS (L and ESC GS 8 L

   m = 48

   fn = 65

   d1 = 67, d2 = 76, d3 = 82

[Function]   Erases all NV graphics data defined by Function 67.

   ・The erased area is set to be an "unused area."

   ・All key codes become undefined.

[Details]   ・Effective only at top of the line in standard mode.

   ・Data for this parameter is discarded in page mode.

   ・Do not use this function for macro definition because this function is not compatible with the macros.

   ・If you use this function, all NV graphics data is erased.

   Take special care if NV graphics data is used in multiple applications.

<Function 66>ESC GS (L pL pH m fn kc1 kc2 (fn=66)

<Function 66>ESC GS 8 L p1 p2 p3 p4 m fn kc1 kc2 (fn=66)

[Name]   Erase the specified NV graphics data

[Code]   ASCII   ESC   GS   (L   pL   pH   m   fn   kc1 kc2

            HEX   1B   1D   28   4C   pL   pH   m   fn   kc1 kc2

            DEC   27   29   40   76   pL   pH   m   fn   kc1 kc2

[Code]   ASCII   ESC   GS   8   L   p1   p2   p3   p4   m   fn   kc1 kc2

            HEX   1B   1D   38   4C   p1   p2   p3   p4   m   fn   kc1 kc2

            DEC   27   29   56   76   p1   p2   p3   p4   m   fn   kc1 kc2

[Defined Area]   ·Parameter for ESC GS (L

            (pL + pH x 256) = 4 (pL=4, pH=0)

            ·Parameter for ESC GS 8 L

            (p1 + p2 x 256 + p3 x 65536 + p4 x 16777216) = 4 (p1=4, p2=0, p3=0, p4=0)

            ·Parameter are shared by ESC GS (L and ESC GS 8 L

            m = 48

            fn = 66

            $32 \leq kc1 \leq 126$

            $32 \leq kc2 \leq 126$

[Function]   Erases the NV graphics data defined by key code kc1 and kc2.

            · The erased area is set to be an "unused area."

            · The erased key code becomes undefined.

[Details]   ·Effective only at the top of the line in standard mode.

            · Data for this counter is discarded in page mode.

            · Do not use this function for macro definition because this function is not compatible with the macros

＜Function 67＞ ESC GS (L pL pH m fn a kc1 kc2 b

xL xH yL yH [c d1 ・・・ dk]1 ・・・ [c d1・・・ dk]b (fn=67)

＜Function 67＞ ESC GS 8 L p1 p2 p3 p4 m fn a kc1 kc2 b

xL xH yL yH [c d1 … dk]1 … [c d1 … dk]b (fn=67)

[Name]   Set the specified NV graphics data

[Code]

	ASCII	ESC	GS	(	L	pL	pH	m	fn	a	kc1	kc2	b
		xL	xH	yL	yH	[c	d1···dk]	1	···	[c	d1 ···	dk]	b
	HEX	1B	1D	28	4C	pL	pH	m	fn	a	kc1	kc2	b
		xL	xH	yL	yH	[c	d1···dk]	1	···	[c	d1 ···	dk]	b
	DEC	27	29	40	76	pL	pH	m	fn	a	kc1	kc2	b
		xL	xH	yL	yH	[c	d1···dk]	1	···	[c	d1 ···	dk]	b

[Code]

	ASCII	ESC	GS	8	L	p1	p2	p3	p4	m	a	kc1	kc2	b
		xL	xH	yL	yH	[c	d1···dk]	1	···	[c	d1 ···dk]	b		
	HEX	1B	1D	38	4C	p1	p2	p3	p4	m	a	kc1	kc2	b
		xL	xH	yL	yH	[c	d1···dk]	1	···	[c	d1 ···dk]	b		
	DEC	27	29	56	76	p1	p2	p3	p4	m	a	kc1	kc2	b
		xL	xH	yL	yH	[c	d1···dk]	1	···	[c	d1 ···dk]	b		

[Defined Area]   ·Parameter for ESC GS (L

$12 \leq (pL + pH \times 256) \leq 65535$ $(0 \leq pL \leq 255, 0 \leq pH \leq 255)$

·Parameter for ESC GS 8 L

$12 \leq (p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) \leq 4294967295$

$(0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255)$

·Parameter are shared by ESC GS (L and ESC GS 8 L

m = 48, fn = 67, a = 48

$32 \leq kc1 \leq 126$

$32 \leq kc2 \leq 126$

b = 1 (Specified only single color)

$1 \leq (xL + xH \times 256) \leq 8192$ $(0 \leq xL \leq 255, 0 \leq xH \leq 32)$

$1 \leq (yL + yH \times 256) \leq 2304$ $(0 \leq yL \leq 255, 0 \leq yH \leq 9)$

c = 49

$0 \leq d \leq 255$

$k = int (((xL + xH \times 256) + 7) \div 8) \times (yL + yH \times 256)$

·Maximum number of Registration capacity

SK1-311	SK1-211	SK1-41	SK5-31
512 KByte	512 KByte	512 KByte	512 KByte
254 pcs	254 pcs	254 pcs	254 pcs

[Function]   Defines the NV graphics data (in raster format) as the record specified by key code kc1 and kc2

· "b" specifies a number of colors of the definition data.

· "xL" and "xH" specify the horizontal size of definition data to (xL + xH x 256) dots.

· "yL" and "yH" specify the vertical size of definition data to (yL + yH x 256) dots.

· "c" specifies the definition data color as follows.

c=49: Black

· "d" specifies the definition data (in raster format).

· If the specified key code already exists in memory, it is overwritten by the specified one.

[Details]   · NV graphics are image data defined in the non-volatile memory of the printer.

· Data definitions for NV graphics data generated by using this command are valid until redefined by this command.

· This command is used to define NV graphics data.

· This function is defined by the raster format.

· Valid only at the top of the line in standard mode.

· When page mode is selected, counter data is received and discarded.

· Do not use this function when defining a macro because it is not compatible with macros.

· If there is not an adequate amount of space to store the NV graphics data, this function cannot be use.
   Use Function 51 to check the available space that can be used.

· k byte data d1 ··· dk are processed as one item of the defined NV graphics data.
   Bits that correspond to the dots to print are "1," and the bits that correspond to the dots that are not printed are "0."

· When single-color (b=1) is selected, this is defined as one data group [c d1 ··· dk].

· NV graphics data is printed using Function 69.

· The relationship of NV graphics data (raster format) and printing results are shown below.

When xL + xH x 256 = 512

$$int((xL+xH\times256)+7)\div8 \ dot = 64 \ Byte$$

1	2	3	········	63	64
65	66	67		127	128
				k-1	k

$(yL+yH\times256)$ dot

7	6	5	4	3	2	1	0

MSB   LSB
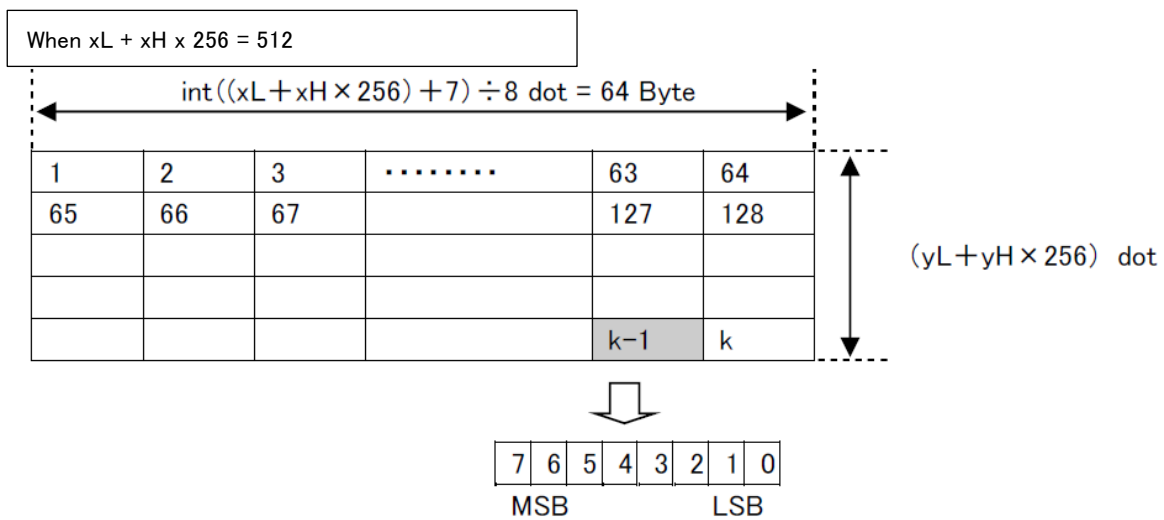
[Note]   · When the specification of (xL + xH x 256), and (yL + yH x 256) exceed the remaining capacity of the NV graphics region, this function does not operate.

· This function uses the NV graphics area of "Number of data sets (k) + Management data (14 bytes)".

\<Function 69\>ESC GS (L pL pH m fn kc1 kc2 x y (fn=69)

\<Function 69\>ESC GS 8 L p1 p2 p3 p4 m fn kc1 kc2 x y (fn=69)

[Name]   Print the specified NV graphics data

[Code]

	ASCII											
ASCII	ESC	GS	(	L	pL	pH	m	fn	kc1	kc2	x	y
HEX	1B	1D	28	4C	pL	pH	m	fn	kc1	kc2	x	y
DEC	27	29	40	76	pL	pH	m	fn	kc1	kc2	x	y

[Code]

	ASCII												
ASCII	ESC	GS	8	L	p1	p2	p3	p4	m	fn	kc1	kc2	x	y
HEX	1B	1D	38	4C	p1	p2	p3	p4	m	fn	kc1	kc2	x	y
DEC	27	29	56	76	p1	p2	p3	p4	m	fn	kc1	kc2	x	y

[Defined Area]   ·Parameter for ESC GS (L
              $(pL + pH \times 256) = 6$ (pL=6, pH=0)
           ·Parameter for ESC GS 8 L
              $(p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) = 6$ (p1=6, p2=0, p3=0, p4=0)
           ·Parameter are shared by ESC GS (L and ESC GS 8 L
              m = 48
              fn = 69
              $32 \leq kc1 \leq 126$
              $32 \leq kc2 \leq 126$
              x = 1, 2
              y = 1, 2

[Function]   Prints the NV graphics data defined by key codes kc1 and kc2.
           ·Selected data can be printed in the "horizontal x-times" and "vertical y-times" scale.

[Details]   ·This function is used to print the NV graphics data defined by Function 67.
           · The printer prints data only when the NV graphics data that matches the specified key code is defined.
             If data with the specified key code is not found, the data of this counter is discarded.
           · This command is effective only when no data exists in the print buffer in standard mode.
             If any data exists in the print buffer, the data for this counter is discarded.
           · Data for this counter is discarded in page mode.
           · If graphics that exceeds the print area size is specified, the data within the print area is printed out but
             the excess data is not printed out.
           · The horizontal and vertical size of NV graphics can be specified by "x" and "y".
           · Excluding upside-down printing, print modes (emphasized printing, overlap printing, underlines, character sizes,
             black/white inverted printing, and 90 degrees rotation) are unaffected.
           · When normal mode or double-width mode is specified, the paper is fed for the number of dots (the height of
             NV graphics) and when double-height mode or 4x mode is specified, the paper is fed for the number of dots
             (NV graphics height multiplied by 2) regardless of the settings of default line spacing (ESC 2) and line feed
             amount (ESC 3).
           · After these graphics are printed, the next printing starts at the beginning of a line (the printer is at
             the "beginning of the line" and has "no print data"), and subsequent data is processed as normal data.
           · This command is affected by the following command settings:
                 Move to absolute position (ESC GS A n1 n2)
                 Move to relative position (ESC GS R n1 n2)
                 Set print area (ESC RS A n)
                 Horizontal tab (HT)
                 Upside-down printing (SI)

ESC GS) L pL pH fn [parameter]

[Name]   Set graphics data

[Code]   ASCII   ESC   GS   )   L   pL   pH   fn   [parameter]

            HEX   1B   1D   29   4C   pL   pH   fn   [parameter]

            DEC   27   29   41   76   pL   pH   fn   [parameter]

[Function]   Executes graphics data processing.

              ·pL, pH specify the parameter count (pL + pH x 256) bytes after fn.

              ·See the function specifications for details on [parameter].

fn	Function No	Function Name
48	Function 48	Send the registered individual logo CRC
49	Function 49	Send the registered individual NV graphics memory capacity
50	Function 50	Send all key code of the registered NV graphics

<Function 48> ESC GS) L pL pH fn kc1 kc2

[Name]   Send the registered individual logo CRC

[Code]

ASCII	ESC	GS	)	L	pL	pH	fn	kc1	kc2
HEX	1B	1D	29	4C	pL	pH	fn	kc1	kc2
DEC	27	29	41	76	pL	pH	fn	kc1	kc2

[Defined Area]   pL = 3, pH = 0

            fn = 48

            $32 \leq kc1 \leq 126$, $32 \leq kc2 \leq 126$

[Function]   Sends a CRC of the logo already stored in the printer.

[Details]   ·The CRC operation is used only for logo graphics data currently stored in the printer.

          · The key codes, size and color information are excluded from the CRC operation.

          · When the printer receives the command, it calculates the CRC and sends it.

          · If a logo containing multiple colors is stored, the logo data of the "n+1" color is added after the logo data of the nth color and calculated.

          · The CRC operation is as follows.

               CRC16:   Polynomial = $x16 + x15 + x2 + x0$

                         Initial Value   FFFF（HEX)

                         Shift direction   Right

                         Output XOR   FFFF（HEX)

                         *See the sample codes for concrete implementation examples.

          · The CRC of only the stored logo can be sent by the "ESC GS (L" or "ESC GS 8 L" command.

          · When logo data is stored, the CRC of the received data is operated.

          · If the logo data exceeds the horizontal print area, the CRC is operated based on the data that is received when logo data is stored.

The CRC is sent in the following format:

   ESC GS) L pL   pH   fn   kc   kc2 CRC data   LF   NUL

                *CRC data is converted into a character string and sent.

If an unregistered key code is specified, the following data is sent instead.

   ESC GS) L pL   pH   fn   kc1 kc2 LF   NUL

\<Command processing flow\>
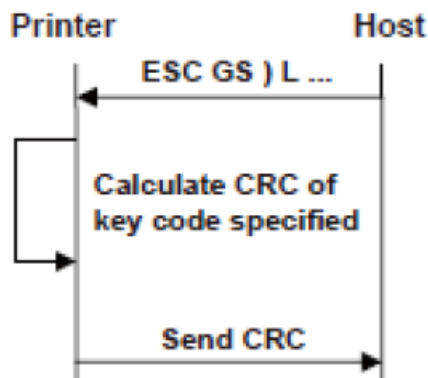
CRC calculation method, Sample codes by C language

```c
#define CRC16 0xA001

unsigned int CalcCrc16( int size, unsigned char data[] )
{
    unsigned int result;
    int i,j;

    result = 0xFFFF;

    for( i=0 ; i<size; i++)
    {
        result ^= data[i];
        for(j = 0x0001; j < 0x0100; j = j << 1)
        {
            if( result & 0x0001 )
            {
                result >>= 1;
                result ^= CRC16;
            }
            else
            {
                result >>= 1;
            }
        }
    }
    result = (~result) & 0xFFFF;
    return result;
}
```

＜Function 49＞ESC GS) L pL pH fn kc1 kc2

[Name]   Transmit capacity used by registered individual NV graphics.

[Code]   ASCII   ESC   GS   (L   pL   pH   fn   kc1   kc2

               HEX   1B   1D   29   4C   pL   pH   fn   kc1   kc2

               DEC   27   29   41   76   pL   pH   fn   kc1   kc2

[Defined Area]   pL = 3, pH = 0

               fn = 49

               $32 \leq kc1 \leq 126$, $32 \leq kc2 \leq 126$

[Function]   Transmits the capacity used by the individual NV graphics data registered in the printer.

[Details]   ・The used capacity is the total number of bytes of the used area.

            ・The used capacity includes the management data (14 bytes).

            ・Only the capacity used by NV graphics data registered with the ″ ESC GS (L″ or ″ ESC GS 8 L″

             command can be transmitted.

            The used capacity is transmitted in the following format:

            ESC GS) L pL pH fn kc1 kc2 [used capacity] LF NUL

            Example: When the used capacity is 1200 bytes, [used capacity] will be "1200" converted into four-byte data

                 (Hex: 31H, 32H, 30H, 30H, Decimal: 49, 50, 48, 48)

            If an unregistered key code is specified, the following data is transmitted instead:

            ESC   GS   )   L   pL   pH   fn   kc1   kc2   LF   NUL

[Reference]   ESC GS (L , ESC GS 8 L

＜Function 50＞ESC GS) L pL pH fn d1 d2

[Name]   Send all key code of the registered NV graphics

[Code]   ASCII   ESC   GS   (L   pL   pH   fn   d1   d2

               HEX   1B   1D   29   4C   pL   pH   fn   d1   d2

               DEC   27   29   41   76   pL   pH   fn   d1   d2

[Defined Area]   pL = 3, pH = 0

               fn = 50

               d1 = 0, d2 = 0

[Function]   Send all key code of NV graphics already stored in the printer.

[Details]   If NV graphics are registered with "ESC GS (L" or "ESC GS 8 L" command, all of their key codes can be sent.

            All key codes are sent in the following format.

               ESC GS   ) L pL pH fn   k1   k2 [key-code key-code ...]   LF   NUL

            Up to 512 key codes can be sent, but logo key codes exceeding this limit are not sent.

            k1 and k2 represent the number of transmission data bytes (k1+k2*256) after the key codes.

            Example: If NV graphics of key codes 01 and 02 are registered, k1=6 and k2=0. [key-code key-code...] is ″0102″

            (HEX: 30H, 31H, 30H, 32H Decimal: 48, 49, 48, 50).

            If NV graphics are not registered, the following data is sent.

               ESC GS   ) L pL pH fn   k1   k2   LF   NUL (where, k1 = 2, k2 =0)

            If the USB interface is used, the NSB must be made invalid.

[Reference]   ESC GS (L , ESC GS 8 L

ESC b n1 n2 n3 n4 d1 ··· dk RS

[Name]   Barcode printing

[Code]   ASCII   ESC   b   n1   n2   n3   n4   d1···dk   RS

         HEX   1B   62   n1   n2   n3   n4   d1···dk   1E

         DEC   27   98   n1   n2   n3   n4   d1···dk   30

[Defined Area] $0 \leq n1 \leq 8$, $48 \leq n1 \leq 56$('0' $\leq n \leq$ '8')

         $1 \leq n2 \leq 4$, $49 \leq n2 \leq 52$('1' $\leq n \leq$ '4')

         $1 \leq n3 \leq 9$, $49 \leq n3 \leq 57$('1' $\leq n \leq$ '9')

         $1 \leq n4 \leq 255$

[Function]   Barcode printing is executed according to the following parameters.

         If n1, n2, n3 and n4 are acquired and detected to be out of the defined area, data up to RS is discarded.

[Caution]   The bar codes that are printed do not conform to each standard, so you should confirm before actual use.

         Particularly, if 1dot is specified, the bar code is not guaranteed.

n1: Barcode type selection

n1	Barcode type
0, 48	UPC-E
1, 49	UPC-A
2, 50	JAN/EAN8
3, 51	JAN/EAN13
4, 52	Code39
5, 53	ITF
6, 54	Code128
7, 55	Code93
8, 56	NW-7

n2: Under-bar character selection and added line feed selection

n2	UPC-E/A, JAN/EAN8, JAN/EAN13, Code128, Code93, Code39, NW-7,ITF		
	Font	Position of under-bar character	line feed after printing
1, 49	--	None	Execute
2, 50	Font A	Under position	Execute
3, 51	--	None	No execute
4, 52	Font A	Under position	No execute

n3: Barcode mode selection

n3	UPC-E/A, JAN/EAN8, JAN/EAN13, Code128, Code93,	Code39, NW-7	ITF
	Minimum module	Narrow: Wide	Narrow: Wide
1, 49	2 dots	2: 6 dots	2: 5 dots
2, 50	3 dots	3: 9 dots	4: 10 dots
3, 51	4 dots	4: 12 dots	6: 15 dots
4, 52	--	2: 5 dots	2: 4 dots
5, 53	--	3: 8 dots	4: 8 dots
6, 54	--	4: 10 dots	6: 12 dots
7, 55	--	2: 4 dots	2: 6 dots
8, 56	--	3: 6 dots	3: 9 dots
9, 57	--	4: 8 dots	4: 12 dots

n4: Barcode height (dot count)

      Form feed at (Bar code height + underbar characters).

      *When there is a character string on the same line as the barcode, if n4 < character height, then n4 = character height.

k (Bar code data count), d (Bar code data)

Barcode type	Defined area of k	Defined area of d
UPC-E	$11 \leq k \leq 12$	$48 \leq d \leq 57$
UPC-A	$11 \leq k \leq 12$	$48 \leq d \leq 57$
JAN/EAN8	$7 \leq k \leq 8$	$48 \leq d \leq 57$
JAN/EAN13	$12 \leq k \leq 13$	$48 \leq d \leq 57$
Code39	$1 \leq k$	$48 \leq d \leq 57$ $65 \leq d \leq 90$ 32, 36, 37, 43, 45, 46, 47
ITF	$1 \leq k$ When an odd number: 0 is automatically applied to the top.	$48 \leq d \leq 57$
Code128	$1 \leq k$	$0 \leq d \leq 127$
Code93	$1 \leq k$	$0 \leq d \leq 127$
NW-7	$1 \leq k$	$48 \leq d \leq 57$ $65 \leq d \leq 68$ 36, 43, 45, 46, 47, 58, 97, 98, 99, 100

      UPC-E: k=11 (or 12)

          The 12th check digit is automatically applied, so it is specified and ignored.

          The command is ignored for data that cannot be shortened.

          Automatically converts data to shortened form.

      UPC-A: k=11 (or 12)

          The 12th check digit is automatically applied, so it is specified and ignored.

      JAN/EAN-8:   k=7 (or 8)

          The 8th check digit is automatically applied, so it is specified and ignored.

      JAN/EAN-13: k=12 (or 13)

          The 13th check digit cannot be automatically applied, so it is specified and ignored.

      Code39: k is freely set, and maximum value differs according to the mode.

          Start/stop code ("*") is automatically applied.

      ITF: k is freely set, and maximum value differs according to the mode.

          If data is oddly numbered, a 0 is applied to the top.

      Code128:   k is freely set, and maximum value differs according to the mode and the print character type.

          The check character is automatically applied.

      Code93:   k is freely set, and maximum value differs according to the mode and the print character type.

          The check character is automatically applied.

      NW-7:   k is freely set, and maximum value differs according to the mode and the print character type.

          Start/stop codes included in the data (not automatically applied).

1) Barcode Specification Details

Refer to the dedicated manuals for characteristics and methods of use for each bar code symbol.

This section describes precautions and methods for setting when printing with the printer.

Barcode widths are set for each bar code according to the mode. The following describes each mode and the dot counts.

The user must ensure the specified printing position and quiet zone at the position where the bar code begins.

1-1) Code39

Code 39 represents numbers 0 to 9 and the letters of the alphabet from A to Z.

(1) Length of one character in each mode.

Items	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Narrow Element Width	2 dots	3 dots	4 dots	2 dots	3 dots
Wide Element Width	6 dots	9 dots	12 dots	5 dots	8 dots
Ratio	1:3	1:3	1:3	1:2.5	1:2.7
Character Spacing	2 dots	3 dots	4 dots	2 dots	3 dots
Length of 1 Character (mm)	4	6	8	3.625	5.625

Items	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	4 dots	2 dots	3 dots	4 dots
Wide Element Width	10 dots	4 dots	6 dots	8 dots
Ratio	1:2.5	1:2	1:2	1:2
Character Spacing	4 dots	2 dots	3 dots	4 dots
Length of 1 Character (mm)	7.25	3.25	4.875	6.5

(∗) The length of 1 character includes the character spacing.

(2) Regulations

The start and stop bar code (∗) in Code 39 are automatically inserted.

1-2) Interleaved 2 of 5

Interleaved 2 of 5 represents numbers 0 to 9. Higher density of characters is possible.

(1) Narrow element width and length of symbols per 2 characters.

Items	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Narrow Element Width	2 dots	4 dots	6 dots	2 dots	4 dots
Wide Element Width	5 dots	10 dots	15 dots	4 dots	8 dots
Ratio	1:2.5	1:2.5	1:2.5	1:2	1:2
Length of 1 Character (mm)	4	8	12	3.5	7

Items	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	6 dots	2 dots	3 dots	4 dots
Wide Element Width	12 dots	6 dots	9 dots	12 dots
Ratio	1:2	1:3	1:3	1:3
Length of 1 Character (mm)	10.5	4.5	6.75	9

(2) Regulations

By selecting interleaved 2 of 5 bar code symbols, start and stop patterns are automatically inserted.

When the bar code data digit count is odd, a zero is added to the highest value digit.

1-3) JAN/EAN/UPC

Used numbers, not only the bar code symbols, are controlled using JAN, EAN and UPC as shared common commercial codes.

(1) Each mode and bar code width

Items		Mode 1	Mode 2	Mode 3
Module Width		2 dots	3 dots	4 dots
Barcode Width (∗)	JAN/EAN-8	16.75mm	25.125mm	33.5mm
	JAN/EAN-13	23.75mm	35.625mm	47.5mm
	UPC-A	23.75mm	35.625mm	47.5mm
	UPC-E	12.75mm	19.125mm	25.5mm

(∗) Includes the guard bar (left/right/center) but not the white space.

(2) Regulations

JAN / EAN-8

Data is in 7 or 8 digits. The command is ignored for others.

The check digit uses a modulus weight of 10/3 and is automatically applied.

When the calculated value and the numerical value of the 8th digit differ, the calculated value has priority.

JAN / EAN-13

Data is in 12 or 13 digits. The command is ignored for others.

The check digit uses a modulus weight of 10/3 and is automatically applied.

When the calculated value and the numerical value of the 13th digit differ, the calculated value has priority.

UPC-A

Data is in 11 or 12 digits. The command is ignored for others.

The check digit uses a modulus weight of 10/3 and is automatically applied.

When the calculated value and the numerical value of the 12th digit differ, the calculated value has priority.

UPC-E

Data is in 11 or 12 digits. The command is ignored for others.

The check digit uses a modulus weight of 10/3 and is automatically applied.

When the calculated value and the numerical value of the 12th digit differ, the calculated value has priority.

Data conversion to rectangles is automatic.

Data that cannot be shortened is processed as invalid data.

1-4) Code128

These are bar code symbols that can print ASCII 128 characters. For that reason, use thereof is increasing.

(1) Each module and module width

Items	Mode 1	Mode 2	Mode 3
Module Width	2 dots	3 dots	4 dots
Length of 1 Character (∗)	2.75mm	4.125mm	5.5mm

(∗) Start and stop bars not included.

(2) Regulations

When using <LF> with the command, control codes are not sent by the host PC, so the control codes are sent as data, as shown below.

When sending the following data, it represents 2 characters set.

% (25H) represents %0 (25H 30H).

・Control codes (00H to 1FH) represent 40H to 5FH applied behind %.

・Control code (7FH) represents %5 (25H 35H).

・Function codes represent 1 to 4 (31H to 34H) applied behind %.

・Start codes represent 6 to 8 (36H to 38H) applied behind %.

・Stop code (SC)/Check character (CK) are automatically applied.

・When start code is omitted: Uses START C when more than 4 digits continue after header.

・Uses START A when initial data other than numbers are the control code. Uses START B for other cases.

(3) 2 Character set code table

<Control Codes>

Code	Format
NUL 00H	%@ 25H 40H
SOH 01H	%A 25H 41H
STX 02H	%B 25H 42H
ETX 03H	%C 25H 43H
EOT 04H	%D 25H 44H
ENQ 05H	%E 25H 45H
ACK 06H	%F 25H 46H
BEL 07H	%G 25H 47H
BS 08H	%H 25H 48H
HT 09H	%I 25H 49H
LF 0AH	%J 25H 4AH
VT 0BH	%K 25H 4BH
FF 0CH	%L 25H 4CH
CR 0DH	%M 25H 4DH
SO 0EH	%N 25H 4EH
SI 0FH	%O 25H 4FH
DLE 10H	%P 25H 50H
DC1 11H	%Q 25H 51H
DC2 12H	%R 25H 52H
DC3 13H	%S 25H 53H
DC4 14H	%T 25H 54H
NAK 15H	%U 25H 55H
SYN 16H	%V 25H 56H
ETB 17H	%W 25H 57H
CAN 18H	%X 25H 58H
EM 19H	%Y 25H 59H
SUB 1AH	%Z 25H 5AH
ESC 1BH	%[25H 5BH
FS 1CH	%¥ 25H 5CH
GS 1DH	%] 25H 5DH
RS 1EH	%^ 25H 5EH
US 1FH	%_ 25H 5FH

<Control Codes>

Code	Format
% 25H	%0 25H 30H
DEL 7FH	%5 25H 35H

<Function Codes>

Code	Format	
FNC1	%1 25H 31H	＊
FNC2	%2 25H 32H	＊
FNC3	%3 25H 33H	＊
FNC4	%4 25H 34H	＊

<Start Codes>

Code	Format	
START A	%6 25H 36H	＊
START B	%7 25H 37H	＊
START C	%8 25H 38H	＊

1-5) Code93

(1) Each mode and module width

Items	Mode 1	Mode 2	Mode 3
Module Width	2 dots	3 dots	4 dots
Length of 1 Character (∗)	2.25mm	3.375mm	4.5mm

(∗) Start and stop bars not included.

(2) Regulations

Start/stop codes are automatically applied.

Check character (C, K) is automatically applied.

2 characters set expression conforms to Code 128.

However, items marked with '∗' are codes that can only be used with Code 128, and not with Code 93.

HRI characters of control characters (〈00〉H to 〈1F〉H, 〈7F〉H) are as follows.

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

1-6) NW-7 (CODABAR)

NW-7 normally uses either A through D as the start/stop codes and represents special symbols (- (minus sign)/ $ (dollar sign)/: (colon)// (slash)/. (period)/+ (plus sign) between 0 to 9.

(1) Length of 1 character in each mode

Items		Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Narrow Element Width		2	3	4	2	3
Wide Element Width		6	9	12	5	8
Ratio		1:3	1:3	1:3	1:2.5	1:27
Character Spacing (dots)		2	3	4	2	3
Length of 1 Character	(Normally mm)	3	4.5	6	2.75	4.25
	(Width mm)	3.5	5.25	7	3.125	5.125

Items		Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width		4	2	3	4
Wide Element Width		10	4	6	8
Ratio		1:2.5	1:2	1:2	1:2
Character Spacing (dots)		4	2	3	4
Length of 1 Character	(Normally mm)	5.5	2.5	3.75	5
	(Width mm)	6.25	2.75	4.125	5.5

With NW-7, lengths differ because narrow elements and wide elements are included according to the characters.

Normal characters (narrow: 5, wide: 2) and numbers (0 to 9), - and $

Wide characters (narrow: 4, wide: 3) , /, . , + , A to D

Character spaces are included in one-character length.

＊Note that QR code is a registered trademark of DENSO WAVE.

This command is for printing 2-dimensional barcode QR codes.

There are four functions of the commands relating to the 2-dimensional barcode QR codes, shown below.

(1) Set barcode type (<ESC> <GS> "y" "S")

(2) Set barcode data (<ESC> <GS> "y" "D")

(3) Set page mode　(Reserved)

(4) Print Barcode　　(<ESC> <GS> "y" "P")

The details of each function are described below.

<u>1. Set barcode type</u>

These commands set the barcode type.

Because all initial values are set, use these only to make changes.
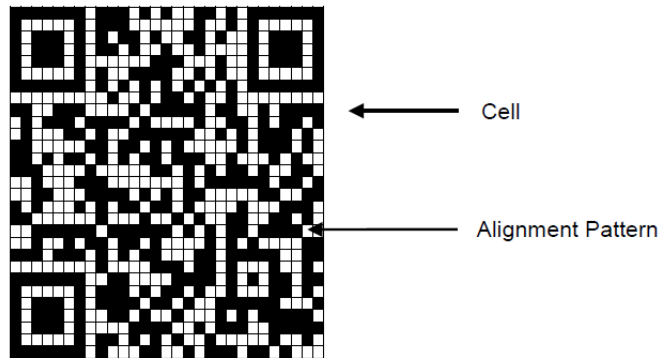
<ESC> <GS> "y" "S" "0" Sets the model

Currently supported models are model 1 and model 2. Model 2 has a configuration including an alignment bar to improve its support of weight to handle skewing when codes are large.

<ESC> <GS> "y" "S" "1" Sets the error correction level.

QR codes can be read even if a part of the data is corrupted, by using error correction.

Raising this level increases the size of the barcode because there is an increase in preparatory information.

<ESC> <GS> "y" "S" "2" Specifies the size of the cell (One four squared regions configuring the QR code).

The QR code is formed into a square of an equivalent size in the vertical and horizontal directions, but the size of the barcode image that is generated depends on the cell size setting.

These settings are individual settings. Therefore, even though there may not be any particular problem in each of them, there is the potential for an error to be generated. (See the descriptions below.) In such cases, the barcode will not be generated and the (4) Print command (<ESC> <GS> "y" "P") is ignored.

(1) Error is generated when generating a barcode by the combination of each setting command.

(2) Print data exceeds the currently set print region.

2. Set barcode data

This command sets the bar code print data.

There are four types of data that can be set using QR codes.

They are: numbers; English characters; binary; and Kanji.

Data setting methods. Specify only the barcode data (data automatic analysis).

3. Set page mode

This command is not used.

4. Print Barcode

This command prints barcodes based on the settings of (1) to (3).

=== Precautions on using these commands ===

The setting values for 1 to 3 are held unless any of the following operations are performed.

   (1) Sending a new setting command.

   (2) Sending an initialize command (<ESC> @)

   (3) Turning the power OFF.

When there is an error in sending a command with 2, the set data is cleared and the command itself is disabled.

4 is sent when necessary.

   (1) When printing, position movement using specify absolute position, specify relative position, and align position are enabled.

   (2) Upside-down printing is possible.

   (3) Printed barcodes should always be checked in an actual use.

ESC GS y S 0 n

[Name] Set QR code model

[Code]
	ASCII	ESC	GS	y	S	0	n
	HEX	1B	1D	79	53	30	n
	DEC	27	29	121	83	48	n

[Defined Area] 1≤n≤2

[Initial Value] n=2

[Function] Sets the QR code model.

N	Set model
1	model 1
2	model 2

ESC GS y S 1 n

[Name] Set QR code mistake correction level

[Code]
	ASCII	ESC	GS	y	S	1	n
	HEX	1B	1D	79	53	31	n
	DEC	27	29	121	83	49	n

[Defined Area] 0≤n≤3

[Initial Value] n=0

[Function] Sets the mistake correction level of QR code.

n	Mistake Correction Level	Mistake Correction Rate (%)
0	L	7
1	M	15
2	Q	25
3	H	30

ESC GS y S 2 n

[Name] Set QR code cell size

[Code]
	ASCII	ESC	GS	y	S	2	n
	HEX	1B	1D	79	53	32	n
	DEC	27	29	121	83	50	n

[Defined Area] 1≤n≤8

[Initial Value] n=3

[Function] Sets the cell size of QR code.

· Parameter details

· n: Cell size (Units: Dots)

· It is recommended that the specification using this command be 3 ≤ n.
  If n = 1 or 2, check by actually using.

ESC GS y D 1 m nL nH d1 d2 ... dk

[Name]   Set QR Code data (Auto Setting)

[Code]   ASCII   ESC   GS   y   D   1   m   nL   nH   d1 d2 ··· dk

            HEX   1B   1D   79   44   31   m   nL   nH   d1 d2 ··· dk

            DEC   27   29   121   68   49   m   nL   nH   d1 d2 ··· dk

[Defined Area]   m = 0

                 $0 \leq nL \leq 255$, $0 \leq nH \leq 255$

                 $1 \leq (nL + nH \times 256) \leq 7089$ (k = nL + nH x 256)

                 $0 \leq d \leq 255$

[Function] Automatically expands the data type of the barcode and sets the data.

            Parameter details

                (1) nL + nH x 256: Byte count of barcode data

                (2) dk: Barcode data (Max. 7089 bytes)

            · When using this command, the printer receives data for the number of bytes (k) specified by nL and nH. The data
               automatically expands to be set as the bar code data.

            · Indicates the number bytes of data specified by the nL and nH.

ESC GS y P

[Name]   Print QR code

[Code]   ASCII   ESC   GS   y   P

            HEX   1B   1D   79   50

            DEC   27   29   121   80

[Function] Prints QR code data.

            When receiving this command, if there is unprinted data in the image buffer, the printer will print the QR code after
            printing the unprinted print data.

            A margin of more than 4 cells is required around the QR code. The user should ensure that space.

            Always check printed QR code in actual use.

This command prints two-dimensional barcode PDF417.

There are three types of commands, according to functions, for two-dimensional barcode PDF417.

  (1) Set barcode type   (<ESC> <GS> "x" "S")

  (2) Set barcode data   (<ESC> <GS> "x" "D")

  (3) Print barcode   (<ESC> <GS> "x" "P")

The following describes the functions in detail.

1. Set barcode type

These commands set the bar code type. Because these are all set with default values, they should be used only when it is necessary to change.
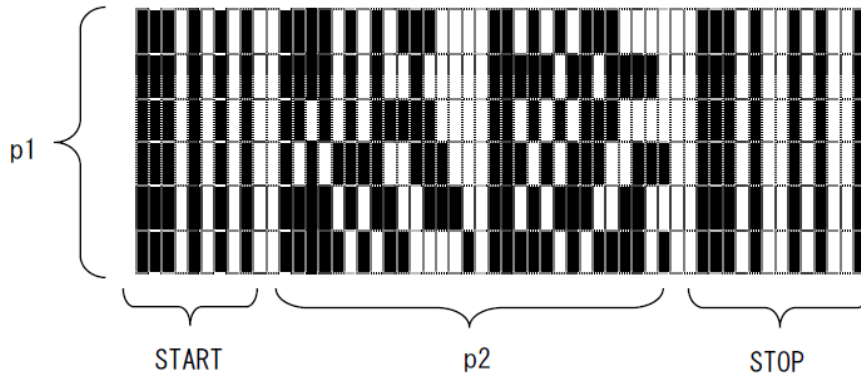
PDF417 is configured by a fixed bar pattern for starting and stopping, and a bar pattern called a code word.

Code words are configured by 17 modules.
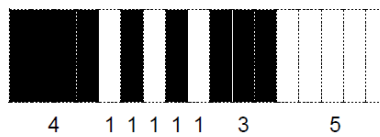
Code Word

<ESC> <GS> "x" "S" "0" specifies values of p1 and p2.

USE_LIMITS mode specifies the ratio of p1 and p2. USE_FIXED mode specifies p1 (line count) and p2 (code word count per line).

<ESC> <GS> "x" "S" "1" specifies values of error correction levels.

PDF417 can read information even if a portion of the data is corrupted by using the error correction.

By increasing this level, the barcode size increases because there is more preparatory information.

<ESC> <GS> "x" "S" "2" and <ESC> <GS> "x" "S" "3" specify the size of the module that configures the code word.

The X direction size (in dot increments) is determined by <ESC> <GS> "x" "S" "2" for the module, and <ESC> <GS> "x" "S" "3" specifies the Y direction size from the aspect.

Module size setting is the basis for the bar code image that is generated, so the resulting print will vary according to that setting.

The settings above are set individually, so the errors described below may be generated even if there is no particular problem in those settings.

In such case, if the bar code is generated the (3) print command (<ESC> <GS> "x" "P") is ignored.

    · Error is generated when generating a bar code, due to the combination of the barcode setting commands.

    · The bar code data that is generated exceeds the printable size of PDF417.

    · Print data exceeds the currently set print region.

2. Set barcode data

This command sets the print data of the barcode.

3. Print barcode

This command prints the barcode according to the settings of (1) and (2).

=== Precautions for use of commands ===

Unless the following operations are performed, the setting values are maintained for 1 and 2.

(1) Sending of new setting commands

(2) Sending an initializing command (<ESC> @)

(3) The power is turned off

Sending 3 when needed

(1) When printing, position shifting according to the horizontal tab, absolute position specification, relative position specification, and position alignment is valid.

(2) Upside-down printing is possible.

(3) When a barcode is printed, always verify it by actual use.

ESC GS x S 0 n p1 p2

[Name]   Set PDF417 barcode size

[Code]   ASCII   ESC   GS   x   S   0   p1   p2

           HEX   1B   1D   78   53   30   p1   p2

           DEC   27   29   120   83   48   p1   p2

[Defined Area]   n= 0, 1

               When n=0: 1≤p1≤99, 1≤p2≤99

               When n=1: p1=0 or 3≤p1≤90, p2=0 or 1≤p2≤30 (However, this excludes. p1=p2 =0)

[Initial Value]   n=0, p1=1, p2=2

[Function] Set the barcode size of PDF417.

n	Specify Method	p1,p2 (Size Specification)
0	USE_LIMITS	p1:p2 Proportions of Vertical (p1) and Horizontal (p2)
		However, p1: p2= 1: 99 to 10: 1 (p1/p2 = 0.01 to 10)
1	USE_FIXED	p1 : Number of lines (0, 3 to 90)
		p2 : Number of columns (0, 1 to 30)
		However, p1xp2 ≤ 928
		When either p1 or p2 specifies 0, it indicates that that setting value is variable.

Setting the bar code size using this command specifies the general size of the bar code. The size will automatically be corrected according to the other settings.

ESC GS x S 1 n

[Name]   Set PDF417 ECC (security level)

[Code]   ASCII   ESC   GS   x   S   1   n

           HEX   1B   1D   78   53   31   n

           DEC   27   29   120   83   49   n

[Defined Area]   0≤n≤8

[Initial Value]   n=1

[Function] Set the security level of PDF417.

           Parameter details

              · n: ECC level (0 to 8)

ESC GS x S 2 n

[Name]   Set PDF417 module X direction size

[Code]   ASCII   ESC   GS   x   S   2   n

           HEX   1B   1D   78   53   32   n

           DEC   27   29   120   83   50   n

[Defined Area]   1≤n≤10

[Initial Value]   n=2

[Function] Set the module X direction size of PDF417

           Parameter details

              · n: Sets the module X direction size (x–dim). (Units: Dots)

           It is recommended that 2≤n when specifying using this command.

           When using with n = 1, check by actual use.

ESC GS x S 3 n

[Name]　　Set PDF417 module aspect ratio

[Code]　　ASCII　ESC　GS　x　S　3　n

　　　　　HEX　　1B　1D　78　53　33　n

　　　　　DEC　　27　29　120　83　51　n

[Defined Area]　1≤n≤10

[Initial Value]　n=3

[Function]　Set the module aspect ratio of PDF417.

　　　　　Parameter details

　　　　　　　n:　Sets the module aspect ratio (asp).

　　　　　It is recommended that 2≤n when specifying using this command.

　　　　　When using with n = 1, check by actual use.

ESC GS x D nL nH d1 d2 ··· dk

[Name]　　Set PDF417 barcode data

[Code]　　ASCII　ESC　GS　x　D　nL　nH　d1 d2 ··· dk

　　　　　HEX　　1B　1D　78　44　nL　nH　d1 d2 ··· dk

　　　　　DEC　　27　29　120　68　nL　nH　d1 d2 ··· dk

[Defined Area]　0≤nL≤255, 0≤nH≤255

　　　　　　　1≤(nL + nH x 256)≤1024

　　　　　　　0≤d≤255

　　　　　　　1≤k≤1024

[Function]　Set the barcode data of PDF417.

　　　　　Parameter details

　　　　　　(1) nL + nH x 256: Barcode data count

　　　　　　(2) dk: Barcode data (Maximum 1024 data)

　　　　　When [nL + nH x 256] is outside of the definition, data of [nL + nH x 256] bytes are discarded.

ESC GS x P

[Name]　　Print PDF417 barcode

[Code]　　ASCII　ESC　GS　x　P

　　　　　HEX　　1B　1D　78　50

　　　　　DEC　　27　29　120　80

[Function]　Prints the barcode data.

　　　　　If there is unprinted data in the line buffer, this command is executed after printing that data in the line buffer.

　　　　　Also, this command is ignored if the following errors occur.

　　　　　　(1) When an error is generated when generating a bar code, due to the combination of the barcode setting.

　　　　　　　commands

　　　　　　(2) When the barcode data that is generated exceeds the printable size of PDF417.

　　　　　　(3) When the print data exceeds the currently set print region.

　　　　　When a barcode is printed, always verify it by actual use.

ESC @

[Name]   Command initialization

[Code]   ASCII   ESC   @

            HEX   1B   40

            DEC   27   64

[Function] Initializes each command after printing data in the line buffer.

Memory switch settings are initialized to the memory switch settings.

Settings item to be initialized.

- ・ ANK characters
- ・ ANK right space
- ・ Character pitch
- ・ International characters
- ・ Code page
- ・ Set slash zero
- ・ Page length
- ・ Current position (move to top of page, top of line)
- ・ Horizontal tab
- ・ Line feed amount
- ・ Set upside-down, position alignment
- ・ Left/right margins

Settings item to be no initialized.

- ・ Set print density
- ・ Set print speed

ESC ? LF NUL

[Name]   Reset printer (execute self print)

[Code]   ASCII   ESC   ?   LF   NUL

            HEX   1B   3F   0A   00

            DEC   27   63   10   0

[Function]   Software resets the printer and executes on self print.

After sending this command, the next data is not sent until the printer is online (in a state wherein it can receive data).   When resetting the printer, the following processes are performed.

I/F	Mode	Process
RS-232C	DTR mode	DTR mark output
	Xon/Xoff mode	Xoff output

ESC GS # m N n1 n2 n3 n4 LF NUL

[Name]   Set memory switch

[Code]

ASCII	ESC	GS	#	m	N	n1	n2	n3	n4	LF	NUL	
HEX	1B	1D	23	m	N	n1	n2	n3	n4	0A	00	
DEC	27	29	35	m	N	n1	n2	n3	n4	10	0	

[Defined Area] $48 \leq n1 \leq 57$ ('0' $\leq n1 \leq$ '9'), $65 \leq n1 \leq 70$ ('A' $\leq n1 \leq$ 'F'), $97 \leq n1 \leq 102$ ('a' $\leq n1 \leq$ 'f')

        $48 \leq n2 \leq 57$ ('0' $\leq n2 \leq$ '9'), $65 \leq n2 \leq 70$ ('A' $\leq n2 \leq$ 'F'), $97 \leq n2 \leq 102$ ('a' $\leq n2 \leq$ 'f')

        $48 \leq n3 \leq 57$ ('0' $\leq n3 \leq$ '9'), $65 \leq n3 \leq 70$ ('A' $\leq n3 \leq$ 'F'), $97 \leq n3 \leq 102$ ('a' $\leq n3 \leq$ 'f')

        $48 \leq n4 \leq 57$ ('0' $\leq n4 \leq$ '9'), $65 \leq n4 \leq 70$ ('A' $\leq n4 \leq$ 'F'), $97 \leq n4 \leq 102$ ('a' $\leq n4 \leq$ 'f')

        m = 87, 84, 44, 43, 45, 64, 42

        $48 \leq N \leq 57$ ('0' $\leq N \leq$ '9'), $65 \leq N \leq (*) 70$ ('A' $\leq N \leq$ 'F'), N=79 (N= 'O'), N=86 (N= 'V'),

        $97 \leq N \leq (*) 102$ ('a' $\leq N \leq$ 'f'), N=111 (N= 'o'), N=118 (N= 'v'),

[Function]   Sends command to write after defining memory switch using the definition command specified by the following classes.

Memory switch information defined by the command to write is written to the nonvolatile memory.

When writing to the nonvolatile memory by the command to write, the printer executes a reset.

If you specify m = 42 ('*'), it will be loaded to the factory settings.

Consider the life of the non-volatile memory and avoid excessive use of this command.

Functions	Class	m	N	n1 n2 n3 n4
Definition data write and reset	Write	"W"	Fixed at "0"	Fixed at "0000"
Definition data write and reset and self-print	Write	"T"	Fixed at "0"	Fixed at "0000"
Data definition (data specification)	Definition	","	N	n1 n2 n3 n4
Data definition (specify bit and set)	Definition	"+"	N	n1 n2 n3 n4
Data definition (specify bit and clear)	Definition	"−"	N	n1 n2 n3 n4
Definition data (all data initialized)	Definition	"@"	Fixed at "0"	Fixed at "0000"
Definition data (load default settings)	Definition	"*"	Fixed at "0"	Fixed at "0000"

m: Mode selection

N: Memory switch number to specify

n1 n2 n3 n4:   Specify data   m = (",") Specify data

                                      m = ("+") Bit number to set

                                        m = ("−") Bit number to clear

ESC RS a n

[Name]   Set status transmission conditions

[Code]   ASCII   ESC   RS   a   n

              HEX   1B   1E   61   n

              DEC   27   30   97   n

[Defined Area] $0 \leq n \leq 3$, $48 \leq n \leq 51$ ('0' $\leq n1 \leq$ '3')

               n = 16, 255

[Initial Value]   Memory switch setting

[Function] Sets the status transmission conditions.

             Settings of this command are unaffected by the ESC @ command.

	Command function selection by memory switches	
n	Status transmission condition settings	Status transmission at command input
0, 48	ASB invalid·NSB Invalid	Status transmission
1, 49	ASB valid·NSB Invalid	
2, 50	ASB invalid·NSB valid	
3, 51	ASB valid·NSB valid	
16	Returns the ASB and NSB settings to the initial state previously set by the Memory switch.	
255	Sends the ASB status information.	

ESC ACK SOH

[Name]   Real-time printer status (ASB status)

[Code]   ASCII ESC ACK SOH

              HEX   1B   06   01

              DEC   27   6   1

[Function] Sends ASB status information to the host.

             This command is not used when ASB is valid.

ETB

[Name]   Update ASB ETB status

[Code]   ASCII ETB

              HEX   17

              DEC   23

[Function] Sets the ASB ETB status when reading this command from the reception buffer. Then, after updating the ASB ETB counter, sends the ASB status.

             The following outlines the details of processes in this command.

                 (1) Reads ETB command from reception buffer.

                 (2) Waits for printing of the print data before the ETB command to end.

                 (3) Increments the ASB ETB counter by 1 after checking that printing has ended, then sets the ASB ETB status.

                 (4) Sends ASB (only when ASB is enabled).

ESC RS E n

[Name]　　Initialize ASB ETB counter and ETB status

[Code]　　ASCII　ESC　　RS　　E　　n

　　　　　　HEX　　1B　　1E　　45　　n

　　　　　　DEC　　27　　30　　69　　n

[Defined Area]　n=, 48 ('0')

[Initial Value]　ASB ETB counter = 0

[Function]　Clears the ASB ETB counter to zero, then clears the ETB status.

　　　　　　However, ASB status is not send when clearing the ETB counter to zero using this command.

ESC GS ETX s n1 n2

[Name]　　Send print-end counter, initialize

[Code]　　ASCII　ESC　　GS　　ETX　　s　　n1　　n2

　　　　　　HEX　　1B　　1D　　03　　s　　n1　　n2

　　　　　　DEC　　27　　29　　3　　s　　n1　　n2

[Defined Area]　0≤s≤5

　　　　　　　0≤n1≤255, 0≤n2≤255

[Function]　　Processes the print end counter according to the s parameter.

　　　　　　This command is run when reading from the reception buffer.

s	Name	Function
0	Print end counter reference	Sends the current print end counter to the host. (Does not wait for print end. Does not count up.)
1	Print end counter update	Runs the following operations. (1) Prints data in line buffer, if data exists. (2) Waits until printing ends (motor stops). (3) Updates the print end counter (increments by 1). (4) Sends print end counter to host.
2	Print end counter clear	Returns the print end counter to its default value (zero clear). (Does not wait for print end. Does not send the print end counter to the host.)
3	Start document 　n1, n2 = 0	(1) Sets data intake mode (2) Initialize
4	End document 　n1, n2 = 0	(1) Prints data in line buffer, if data exists. (2) Waits until printing ends (motor stops). (3) Cancels data intake mode
5	Data timeout setting	n1=0: Initializes to the content of Memory switch. (n2=0) n1=1: Data timeout setting. n2=0: Timeout disabled Others: n2: Data timeout time (units: seconds 1 to 255 seconds) n1=2: Sends the current timeout setting to the host. (n2=0)

　　　　　　The data formats sent to the host when s = 0 or s =1 are shown below.

　　　　〈Returned Data Formats〉

　　　　　ESC　　　GS　　　ETX　　s　　n1　　n2　　[Print end counter]　　NUL

　　　　　〈1B〉H　〈1D〉H　〈03〉H　　s　　n1　　n2　　[Print end counter]　　00

　　　　*Echoes back the specified contents from the host as is until ESC GS ETX s n1 n2, and then sends the print end counter value and NUL.

　　　　When [Print end counter] is 1 byte in length, the initial value is 0x00.

　　　　When s = 1, increments by 1 each time the command is processed. After 0xFF, returns to 0x00.

　　　　There is one [Print end counter] in the printer that is unrelated to the n1, n2 values.

　　　　(There is no counter for the n1, n2 values.)

When s = 3, and s = 4 (Document start command + document end command), printer operates as though in data cancel mode.

If there is an error after receiving the document start command, reception data is received and discarded until the document end command is received when the printer is recovered from the error.

If the document end command cannot be recognized, all reception data is destroyed. (Data intake mode)

Timeouts are 10 seconds. Automatically cancels the data intake mode.

[Restrictions]

(1) Throughput reduction.

(2) Erroneous printing occurs if the same data as the End command is contained in the raster data or bit image data.

(3) Invalid when in Page mode

In initialization processing when s = 3 is specified, initialization equivalent to <ESC> "@" is executed.

<T:TOP Command/E:END Command>
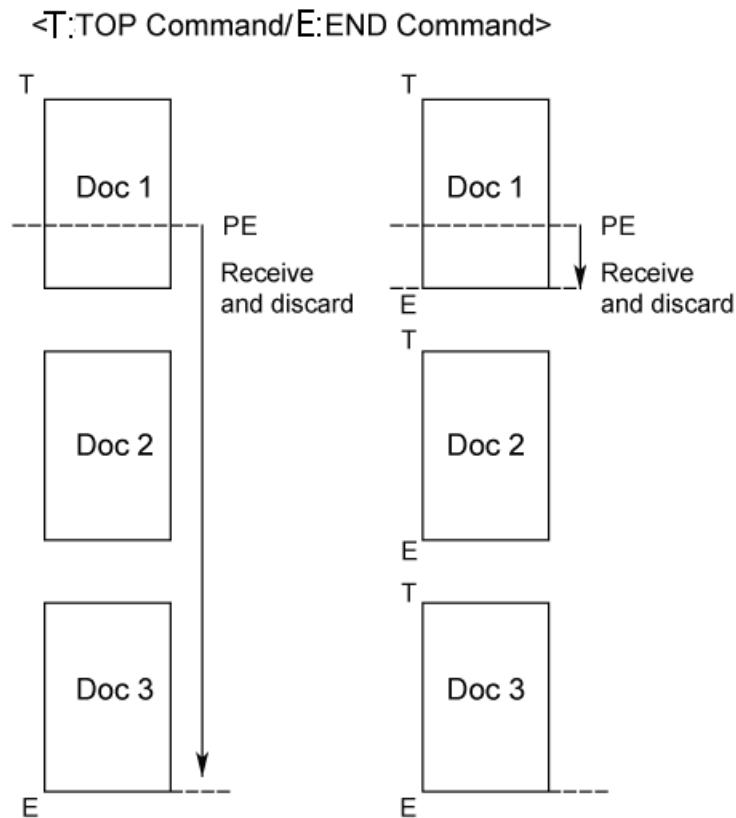
The interface disconnection detection function through data reception timeout is controlled when s=5 is specified.

When this function is enabled, the interface is determined to have been disconnected when no data is received for a specified period of time at the data read section of the printer.

When a disconnection is detected during a command execution, the command parsing is stopped.

ESC GS) I pL pH fn d1 d2

[Name]   Transmit all types of multibyte fonts

[Code]

	ASCII	ESC	GS	)	I	pL	pH	fn	d1	d2
	HEX	1B	1D	29	49	pL	pH	fn	d1	d2
	DEC	27	29	41	73	pL	pH	fn	d1	d2

[Defined Area]   pL=3, pH=0

               fn=48

               d1=0, d2=0

[Function] Transmits all types of multibyte fonts installed in the printer.

Information is transmitted in the following format:

ESC GS) I pL pH fn k1 k2 [font type 1, font type 2, ···] LF NUL

k1 and k2 indicate the number of data bytes (k1 + k2 ＊ 256) transmitted after the multibyte font type.

When two or more multibyte fonts are installed, the fonts are transmitted separated by a separator (2Ch).

The multibyte font type is transmitted as a character string.

Japanese	"KANJI JAPANESE"
Simplified Chinese GB2312	"GB2312 CHINA GB2312"
Simplified Chinese GB18030	"GB18030 CHINA GB18030"
Simplified Chinese BIG5	"BIG5 TAIWAN BIG-5"
Korean	"KOREA C-5601C"

As the standard specification does not have multi-byte fonts, the following data is sent.

ESC, GS,), I, <03>H, 00, 48, <02>H, 00, <0A>H, 00

ESC GS) I pL pH fn

[Name]   Transmit printer information

[Code]   ASCII   ESC   GS   )   I   pL   pH   fn

         HEX   1B   1D   29   49   pL   pH   fn

         DEC   27   29   41   73   pL   pH   fn

[Defined Area]   pL=1, pH=0

            fn=49

[Function]   Transmits printer information to the printer.

Information is transmitted in the following format:

ESC GS) I pL pH fn [Tag Name = parameter, Tag Name = parameter,···] LF NUL

The top of each parameter is accompanied by a tag name, and a parameter corresponding to each tag name is transmitted.

The tag name is up to the equal sign '='. After that, it will be parameters.

Each tag and parameter set are separated by the delimiters ',' <2CH>.

LF and NUL indicate the end. From then on, the tag and its parameters are not sent.

Tag Name	Information Type	Parameter
PrHwV	Printer Unit Version	In the case of Ver 1.00.00: "1.00.00"
PrSrN	Product serial number	16 digits fixed length. If not registered: "0000000000000000"

Example: HW Ver = 1.00.00 S/No=1234567890123456

       ESC, GS,), I, <01>H, 00, 49, "PrHwV=1.00.00,PrSrN=1234567890123456", LF, NUL

ESC RS d n

[Name]   Set print density

[Code]   ASCII   ESC   RS   d   n

              HEX   1B   1E   64   n

              DEC   27   30   100   n

[Defined Area] $0 \leq n \leq 3$, $48 \leq n \leq 51$ ('0' $\leq n \leq$ '3')

[Initial Value]   Memory switch setting

[Function]   Sets print density.

        This command executes after stopping the printing operation.

n	Print Density
0, 48	+3
1, 49	+2
2, 50	+1
3, 51	Standard

ESC RS r n

[Name]   Set print speed

[Code]   ASCII   ESC   RS   r   n

              HEX   1B   1E   72   n

              DEC   27   30   114   n

[Defined Area] $0 \leq n \leq 7$, $48 \leq n \leq 55$ ('0' $\leq n \leq$ '7')

[Initial Value]   Memory switch setting

[Function]   Sets print speed.

        This command executes after stopping the printing operation.

〈SK1-211, SK1-221, SK1-311, SK1-321, SK5-31 series〉

N	Print Speed
0, 48	250mm/sec
1, 49	190mm/sec
2, 50	110mm/sec
3, 51	220mm/sec
4, 52	200mm/sec
5, 53	170mm/sec
6, 54	150mm/sec
7, 55	130mm/sec

〈SK1-41 series〉

N	Print Speed
0, 48	150mm/sec
1, 49	(Reserved)
2, 50	110mm/sec
3, 51	(Reserved)
4, 52	(Reserved)
5, 53	(Reserved)
6, 54	150mm/sec
7, 55	130mm/sec

ESC GS) U pL pH fn m (fn = 48)

[Name]　　　Select UTF-8 code

[Code]　　　ASCII　ESC　GS　)　U　pL　pH　fn　m

　　　　　　　HEX　　1B　1D　29　55　pL　pH　fn　m

　　　　　　　DEC　　27　29　41　85　pL　pH　fn　m

[Defined Area]　pL = 2, pH = 0

　　　　　　　　fn = 48

　　　　　　　　m = 0, 1

[Initial Value]　m = 0

[Function]　　Select UTF-8 code

　　　　　　　Specify validity / invalidity of UTF-8

m	Contents
0	UTF-8 invalid
1	UTF-8 valid (1byte ANK Character)

The following commands control top of form functions using black mark paper.

The following commands are effective only when black mark is set to be effective.

ESC d n

[Name]   Auto cutter

[Code]   ASCII   ESC   d   n

            HEX   1B   64   n

            DEC   27   100   n

[Defined Area] $0 \leq n \leq 3$, $48 \leq n \leq 51$

[Function] Executes the auto-cutter.

        After auto-cutter is executed, the printer considers that to be the top of the page.

        Print data in line buffer is printed before a cut.

        n = 2, 50 or 3, 51 is a parameter whose operation is switched when the black mark is valid.

n	Contents
0, 48	Full cut at the current position.
1, 49	Partial cut at the current position.
2, 50	After executing top of form, paper is fed to cutting position, then a full cut.
3, 51	After executing top of form, paper is fed to cutting position, then a partial cut.

     When presenter is connected, cutting is executed by changing the partial-cut to full-cut.

FF

[Name]   Execute top of form

[Code]   ASCII   FF

            HEX   0C

            DEC   12

[Function] Executes top of form.

ESC C n

[Name]   Set page length to n line

[Code]   ASCII   ESC   C   n

            HEX   1B   43   n

            DEC   27   67   n

[Defined Area] $1 \leq n \leq 127$

[Initial Value]   n=42

[Function]   When black mark is effective, this command is ignored.

The following commands control for the presenter functions.

The following commands are the effective only on models equipped with a presenter.

ESC SYN 0 n

[Name]   Execute presenter paper recovery

[Code]   ASCII   ESC SYN   0 n

             HEX   1B   16 30 n

             DEC   27   22 48 n

[Defined Area]   n=0, 48 ('0')

[Function]   Execute presenter paper recovery

             This command is ignored when a presenter is not connected.

             Also, this command is executed when paper is supplied by the presenter, exists in the presenter and the paper has been cut. This command is ignored with under all other conditions. (Ignored when paper is being recovered.)

ESC SYN 1 n

[Name]   Set presenter paper automatic recovery function and automatic recovery time

[Code]   ASCII   ESC SYN   1 n

             HEX   1B   16 31 n

             DEC   27   22 49 n

[Defined Area] $0 \leq n \leq 255$

[Initial Value]   Memory switch setting

[Function]   Sets presenter paper automatic recovery function and automatic recovery time.

             This command is ignored when a presenter is not connected.

             The setting by this command is effective at idle time.

             Settings using this command are effective from the next sheet when the printer processes this command and paper has already been supplied to the presenter.

n	Contents
0	Paper automatic recovery function invalid.
$1 \leq n \leq 255$	Paper automatic recovery function valid. Automatic recovery time: n x 0.5 sec (0.5 sec to 127.5 sec)

ESC SYN 2 n

[Name]   Set presenter operation mode

[Code]   ASCII   ESC SYN   2   n

          HEX   1B   16   32   n

          DEC   27   22   50   n

[Defined Area] $0 \leq n \leq 4$

[Initial Value]   Memory switch setting

[Function]   Set presenter operation mode

        This command is ignored when a presenter is not connected.

        The setting by this command is effective at idle time.

        Settings using this command are effective from the next sheet when the printer processes this command and paper has already been supplied to the presenter.

n	Contents
0	Stored in device (loop effective) → Wait for discharge paper → Recovered in device
1	Stored in device (loop effective) → Wait for discharge paper → Discharged
2	Stored in device invalid (loop invalid) → Wait for discharge paper → Recovered in device
3	Stored in device invalid (loop invalid) → Wait for discharge paper → Discharged
4	Stored in device invalid (loop invalid) → Discharged

ESC SYN 3 n

[Name]   Acquire presenter paper counter

[Code]   ASCII   ESC SYN   3   n

          HEX   1B   16   33   n

          DEC   27   22   51   n

[Defined Area]   n = 0, 1, 48, 49 ('0' , '1')

[Initial Value]   ---

[Function] Acquires presenter paper counter.

n	Contents
0, 48	Acquires paper reel counter
1, 49	Acquires paper recovery counter

        This command is ignored when a presenter is not connected.

        Counter can count to 0xFFFFFFFF sheets.

        Counter is cleared to zero when the following conditions are met.

         ・ At a printer reset

         ・ At the <CAN> command

         ・ At the <ESC> <SYN> 4 n command

        The paper counter using this command sends the counter value at the time this command is processed.

        <Counter transmission format from printer: When using the paper reel counter>

        Printer transmission : ESC   SYN   3   n c1 c2 c3 c4

                                <1B>H, <16>H, <33>H, 00, c1 c2 c3 c4

        Reel counter   : c4 + (c3 x 256) + (c2 x 256 x 256) + (c1 x 256 x 256 x256)

        The counter is counted up when paper is completely recovered or when pulled out.

        The counter counts from when the power is turned ON, excluding the following.

         ・ When paper is discharged because of an error

         ・ When printing using self-print

         ・ When paper in the presenter is discharged when the power is turned ON

ESC SYN 4 n

[Name]　　　Initialize presenter paper counter

[Code]　　　ASCII　ESC　SYN　4　n

　　　　　　　HEX　　1B　　16　　34　n

　　　　　　　DEC　　27　　22　　52　n

[Defined Area]　n = 0

[Initial Value]　---

[Function]　　Initializes the presenter paper counter (paper reel counter/paper recovery counter).

　　　　　　　Initialization of the paper counter using this command is executed when this command is processed.

ESC GS SUB DC3 m t1 t2

[Name]　　　Directly execute the operation of the Presenter LED.

[Code]　　　ASCII　ESC　GS　SUB　DC3　m　　t1　　t2

　　　　　　　HEX　　1B　　1D　　1A　　13　　m　　t1　　t2

　　　　　　　DEC　　27　　29　　26　　19　　m　　t1　　t2

[Defined Area]　$1 \leq m \leq 2$, $49 \leq m \leq 50$ ('1' $\leq m \leq$ '2')

　　　　　　　$0 \leq t1 \leq 255$, $0 \leq t2 \leq 255$

[Initial Value]　---

[Function]　Directly execute the operation of the red and green (blue) LEDs of the Presenter LED it.

m	Contents
1, 49	Green(Blue)LED
2, 50	Red LED

t1 specifies the ON time for the Presenter LED output.

　　When $1 \leq t1 \leq 255$: ON time = t1 x 100 msec

　　When t1 = 0: When ON time is default value

t2 specifies the OFF time for the Presenter LED output.

　　When $0 \leq t2 \leq 255$: OFF time = t2 x 100 msec

　　When t2 = 0: When OFF time is default value

This command has priority if received while outputting the Presenter LED in the operation mode specified by the <ESC><GS><SUB><DC1> m t1 t2 command.

Only one of the LEDs can be executed. (Cannot simultaneously light green (blue) −red LED)

The following commands control for the bezel functions.

The following commands are the effective only on models equipped with a bezel.

<SK1-211, SK1-221, SK1-311, SK1-321 series>

Bezel related command is available with firmware version 1.1 or higher.

ESC SYN DC1 n

[Name]　　　Set Bezel function mode

[Code]　　　ASCII　　ESC　SYN　DC1　n

　　　　　　HEX　　　1B　　16　　11　　n

　　　　　　DEC　　　27　　22　　17　　n

[Defined Area]　　n = 0, 1, 255

[Initial Value]　　Memory switch setting

[Function]　　　Specify the Bezel function mode by selecting n parameter.

m	Bezel Function Mode
0	Invalid
1	Valid
255	Memory switch setting

・Models without bezel ignore 4 bytes.

・This setting is not cleared by ESC @ command

・If the paper is already fed into the bezel inside when this command is processed, this setting becomes effective from next printing.

ESC SYN DC2 n

[Name]　　　Set Bezel guide

[Code]　　　ASCII　　ESC　SYN　DC2　n

　　　　　　HEX　　　1B　　16　　12　　n

　　　　　　DEC　　　27　　22　　18　　n

[Defined Area]　　n = 0, 1, 255

[Initial Value]　　Memory switch setting

[Function]　　　Specify the Bezel guide by selecting n parameter.

m	Bezel guide
0	Invalid
1	Valid
255	Memory switch setting

・When the setting is enabled, the printer operation is as follows.

　When paper cut is performed by either of timeout (Printer does not receive a cut command for 10 seconds or more after printing) or paper cut performed by paper cut command,

　printer automatically feeds the paper up to 60mm paper length and then the printer performs a paper cut.

・For the operation when the setting is disabled, even if the paper is feed for 60mm or less, the cut is executed without the paper feed correction.

・This setting is not cleared by ESC @ command

・If the paper is already fed into the bezel inside when this command is processed, this setting becomes effective from next printing.

ESC SYN DC3 n

[Name]   Set Bezel Hold Print

[Code]   ASCII   ESC SYN DC3   n

              HEX   1B   16   13   n

              DEC   27   22   19   n

[Defined Area]   n = 0 ('0'), 1('1'), 255

[Initial Value]   Memory switch setting

[Function]   Specify the Bezel hold print by selecting n parameter.

m	Bezel guide
0, 48	Invalid
1, 49	Valid
255	Memory switch setting

・Operation when the setting is enabled:

　When the status of bezel paper detection sensor is no paper, it is possible to print the following data.

　When there is a paper, the next data is on held until the bezel paper detection sensor detects "no paper",

　and the data held is printed after paper pulled out.

・Operation when the setting is disabled:

　The following data can be printed regardless of the status of bezel paper detection sensor.

・This setting is not cleared by ESC @ command

・When this command is processed, in case printer has print data in the image buffer, this command is processed

　after the print data is performed.

ESC SYN DC4 n

[Name]   Set Bezel Paper Status

[Code]   ASCII   ESC SYN DC4   n

              HEX   1B   16   14   n

              DEC   27   22   1A   n

[Defined Area]   n = 0 ('0'), 1('1'), 255

[Initial Value]   Memory switch setting

[Function]   Specify the Bezel paper status by selecting n parameter.

m	Bezel guide
0, 48	Invalid
1, 49	Valid
255	Memory switch setting

・Operation when the setting is enabled:

　The condition of bezel paper detection sensor is responded with the status.

　The update timing is made during standby of printer or after completing the paper cut.

・Operation when the setting is disabled:

　The condition of the bezel paper detection sensor always responds with the status of "No paper".

・This setting is not cleared by ESC @ command

・When this command is processed, in case there is unprinted data in the image buffer, this command is processed

　after carrying out the printing.

ESC GS) s pl ph fn m

[Name]   Transmits the information of bezel installed in the printer.

[Code]   ASCII   ESC   GS   )   s   pL   pH   fn   m

           HEX   1B   1D   29   73   pL   pH   fn   m

           DEC   27   29   41   115 pL   pH   fn   m

[Defined Area]   pL=2, pH=0, fn=48, m=1

[Function] Transmits the information of bezel installed in the printer.

Information is transmitted in the following format:

   ESC GS) s pL pH fn n m LF NUL

n	Bezel installed information
0	No installation
1	Installation

pL and pH indicate the number of data bytes (pL + pH * 256) transmitted after the bezel installation.

In the standard specification with bezel, the following data is sent.

   ESC, GS,), s, <02>H, 00, 48, 01(Installation), 01(m), <0A>H, 00

When parameters outside the definition range are received, the reply format for models that do not support the bezel is as follows.

   ESC, GS,), s, 00, 00, fn, <0A>H, 00

〈SK1-211, SK1-221, SK1-311, SK1-321, SK5-31 series〉

The following commands are the effective only on models equipped with a LED Presenter or LED bezel.

ESC GS SUB DC1 m t1 t2

[Name]   Specify Presenter / Bezel LED operation mode

[Code]   ASCII   ESC GS   SUB   DC1   m   t1   t2

            HEX   1B   1D   1A   11   m   t1   t2

            DEC   27   29   26   17   m   t1   t2

Version 1.1 or higher has the following specifications.

[Defined Area]   0≤m≤4, 48≤m≤51 ('0' ≤m≤ '4')

                 t1= 0, t2 = 0

[Initial Value] Memory switch setting

[Function]   Specify the Presenter / Bezel LED operation mode using the m parameter.

m	Presenter / Bezel LED Operating Mode
0, 48	Presenter / Bezel LED output OFF
1, 49	Presenter / Bezel LED output ON (while printing, or there is paper in the presenter / bezel.)
2, 50	Presenter / Bezel LED output ON (during an error)
3, 51	Presenter / Bezel LED output ON (while printing, or there is paper in the presenter / bezel or during an error)
4, 52	Presenter / Bezel LED output ON (while printing, or there is paper in the presenter / bezel or during an error or printer Idle)

Version 1.0 has the following specifications.

[Defined Area]   0≤m≤3, 48≤m≤51 ('0' ≤m≤ '3')

                 t1= 0, t2 = 0

[Initial Value] Memory switch setting

[Function]   Specify the Presenter LED operation mode using the m parameter.

m	Presenter LED Operating Mode
0, 48	Presenter LED output OFF
1, 49	Presenter LED output ON (while printing, or during presenter operation)
2, 50	Presenter LED output ON (during an error)
3, 51	Presenter LED output ON (while printing, or during presenter operation or an error)

ESC GS SUB DC2 m t1 t2

[Name]   Specify the Presenter / Bezel LED ON/OFF

[Code]   ASCII   ESC   GS   SUB   DC2   m   t1   t2

           HEX   1B   1D   1A   12   m   t1   t2

           DEC   27   29   26   18   m   t1   t2

Version 1.1 or higher has the following specifications.

[Defined Area] $1 \leq m \leq 3$, $49 \leq m \leq 51$ ('1' $\leq m \leq$ '3')

                      $0 \leq t1 \leq 255$, $0 \leq t2 \leq 255$

[Initial Value]   t1=1, t2=1 (at m=1, 2)

                      t1=1, t2=0 (at m=3)

[Function]   Specify the Presenter / Bezel LED ON/OFF times.

m	Status of the printer and Presenter / Bezel paper sensor
1, 49	This command specifies the LED ON/OFF times to blink green (blue) while existing paper in presenter / bezel. While printing, the LED lights green (blue)
2, 50	This command specifies the LED ON/OFF times to blink red for recoverable and non-recoverable.
3, 51	This command specifies the LED ON/OFF times to blink green (blue) while printer Idle.

t1 specifies the LED unit ON time.

   When $1 \leq t1 \leq 255$: ON time = t1 x 100 msec

t2 specifies the LED unit OFF time.

   When $1 \leq t2 \leq 255$: OFF time = t2 x 100 msec

In case of "t1=0, t2≠0" or "t1=0, t2=0", the presenter/bezel LED is turned off.

In case of "t1≠0", "t2=0", the presenter/bezel LED is turned on.

Only one of the LEDs can be executed. (Cannot simultaneously light green (blue) – red LED)

Version 1.0 has the following specifications.

[Defined Area] $1 \leq m \leq 2$, $49 \leq m \leq 50$ ('1' $\leq m \leq$ '2')

                      $0 \leq t1 \leq 255$, $0 \leq t2 \leq 255$

[Initial Value]   t1=1, t2=1

[Function]   Specify the Presenter LED ON/OFF times.

m	Presenter LED Operating Mode
1, 49	This command specifies the LED ON/OFF times while the presenter is operating. *LED lights green (blue)
2, 50	This command specifies the LED ON/OFF times for recoverable and non-recoverable errors. *LED lights red

t1 specifies the LED unit ON time.

   When $1 \leq t1 \leq 255$: ON time = t1 x 100 msec

   When t1 = 0: When ON time is default value

t2 specifies the LED unit OFF time.

   When $1 \leq t2 \leq 255$: OFF time = t2 x 100 msec

   When t2 = 0: When OFF time is default value

Only one of the LEDs can be executed. (Cannot simultaneously light green (blue) –red LED)

〈SK5-31 series〉

ESC GS) N pL pH fn [parameter]

[Name]   Set network parameters

[Code]   ASCII   ESC   GS   )   N   pL   pH   fn   [parameter]

          HEX   1B   1D   29 4E pL   pH   fn   [parameter]

          DEC   27   29   41 78 pL   pH   fn   [parameter]

[Function]   Executes actions related to the network parameter.

          ・With "pL" and "pH", the parameter count after "fn" is specified to (pL + pH x 256) bytes.

          ・For [parameter], see the specification by function.

Some functions require login, and some require login password change.

fn	Code	Function	Login	Login password change
48	ESC GS) N pL pH fn m n	Set acquisition method for IP address	Not necessary	Not necessary
49	ESC GS) N pL pH fn m d1 d2 d3 d4	Set IP Address	Not necessary	Not necessary
50	ESC GS) N pL pH fn m d1 d2 d3 d4	Set subnet mask	Not necessary	Not necessary
51	ESC GS) N pL pH fn m d1 d2 d3 d4	Set default gateway	Not necessary	Not necessary
52	ESC GS) N pL pH fn m n	Set DHCP Timeout	Not necessary	Not necessary
54	ESC GS) N pL pH fn m n1 n2	Set 9100 Data Timeout	Not necessary	Not necessary
58	ESC GS) N pL pH fn m d1 d2 d3 d4	Set DNS 1	Necessary	Necessary
59	ESC GS) N pL pH fn m d1 d2 d3 d4	Set DNS 2	Necessary	Necessary
64	ESC GS) N pL pH fn m	Transmit acquisition method for IP address	Not necessary	Not necessary
65	ESC GS) N pL pH fn m	Send IP Address	Not necessary	Not necessary
66	ESC GS) N pL pH fn m	Send subnet mask	Not necessary	Not necessary
67	ESC GS) N pL pH fn m	Send default gateway	Not necessary	Not necessary
68	ESC GS) N pL pH fn m	Send DHCPTimeout	Not necessary	Not necessary
70	ESC GS) N pL pH fn m	Send 9100 Data Timeout	Not necessary	Not necessary
74	ESC GS) N pL pH fn m	Send DNS 1	Necessary	Necessary
75	ESC GS) N pL pH fn m	Send DNS 2	Necessary	Necessary
80	ESC GS) N pL pH fn m n	Set TCP#9100（Valid only）	Not necessary	Not necessary
81	ESC GS) N pL pH fn m	Send TCP#9100	Not necessary	Not necessary
82	ESC GS) N pL pH fn m n	Set TCP#9101（Valid only）	Not necessary	Not necessary
83	ESC GS) N pL pH fn m	Send TCP#9101	Not necessary	Not necessary
84	ESC GS) N pL pH fn m n	Set LPR（Valid only）	Not necessary	Not necessary
85	ESC GS) N pL pH fn m	Send LPR	Not necessary	Not necessary
86	ESC GS) N pL pH fn m n	Set UDP#22222（Valid only）	Not necessary	Not necessary
87	ESC GS) N pL pH fn m	Send UDP#22222	Not necessary	Not necessary
112	ESC GS) N pL pH fn m n	Save network parameters	*1	*1
113	ESC GS) N pL pH fn m n	Initialize network parameters	*1	*1
114	ESC GS) N pL pH fn m d1 … dk	Execute login	Not necessary	Not necessary
115	ESC GS) N pL pH fn m	Send login status	Not necessary	Not necessary
116	ESC GS) N pL pH fn m n	Execute logout	Necessary	Not necessary
128	ESC GS) N pL pH fn m d1 … dk	Set login password	Necessary	Not necessary
129	ESC GS) N pL pH fn m	Send login password change status	Necessary	Not necessary

*1: For details, refer to the relevant specification for each function.

The following shows an example of actual command transmission.

Example 1: When setting a network parameter that does not require login

fn	Host transmission data	Printer response data	
64	ESC GS) N 0x02 0x00 0x40 0x01		"Sending IP Address Acquisition Method" Send command
		ESC GS) N 0x02 0x00 0x40 0x01 0x00 LF NUL	Setting value of acquisition method of IPAddress. Return "DHCP"
65	ESC GS) N 0x02 0x00 0x41 0x01		"Sending IP Address" Send command
		ESC GS) N 0x02 0x00 0x41 0x01 0x00 0x00 0x00 0x00 LF NUL	IP Address setting value Return "0.0.0.0"
66	ESC GS) N 0x02 0x00 0x42 0x01		"Subnet Mask transmission" Send command
		ESC GS) N 0x02 0x00 0x42 0x01 0x00 0x00 0x00 0x00 LF NUL	Subnet Mask setting value Return "0.0.0.0"
67	ESC GS) N 0x02 0x00 0x43 0x01		"Send Default Gateway" Send command
		ESC GS) N 0x02 0x00 0x43 0x01 0x00 0x00 0x00 0x00 LF NUL	Default Gateway setting value Return "0.0.0.0"
68	ESC GS) N 0x02 0x00 0x44 0x01		"Send DHCP Timeout" Send command
		ESC GS) N 0x02 0x00 0x44 0x01 0x01 LF NUL	DHCP Timeout setting value Return "Valid"
70	ESC GS) N 0x02 0x00 0x46 0x01		"Sending 9100 Data Timeout" Send command
		ESC GS) N 0x02 0x00 0x46 0x01 0x00 LF NUL	9100 Data Timeout setting value Return "0 Sec."
48	ESC GS) N 0x03 0x00 0x30 0x01 0x01		Set IP Address acquisition method to "Static"
49	ESC GS) N 0x06 0x00 0x31 0x01 0xC0 0xA8 0x01 0x0A		Set IP Address to "192.168.1.10"
50	ESC GS) N 0x06 0x00 0x32 0x01 0xFF 0xFF 0xFF 0x00		Set Subnet Mask to "255.255.255.0"
51	ESC GS) N 0x06 0x00 0x33 0x01 0xC0 0xA8 0x01 0xFE		Set Default Gateway to "192.168.1.254"
52	ESC GS) N 0x03 0x00 0x34 0x01 0x00		Set DHCPTimeout setting to "Invalid"
54	ESC GS) N 0x03 0x00 0x36 0x01 0x1E 0x00		Set 9100 Data Timeout setting to "30 Sec."
112	ESC GS) N 0x03 0x00 0x70 0x01 0x00		Save the above settings

Example 2: When setting a network parameter that requires login

fn	Host transmission data	Printer response data	
114	ESC GS) N 0x08 0x00 0x72 0x01 0x70 0x75 0x62 0x6C 0x69 0x63		Execute Login Default password "public"
115	ESC GS) N 0x02 0x00 0x73 0x01		"Send Login Status" Send command
		ESC GS) N 0x02 0x00 0x73 0x01 0x01 LF NUL	Return "Logged In"
129	ESC GS) N 0x02 0x00 0x81 0x01		"Send Login Password Change Status" Send command
		ESC GS) N 0x02 0x00 0x81 0x01 0x00 LF NUL	Return "Login Password Not Changed"
128	ESC GS) N 0x0A 0x00 0x80 0x01 0x61 0x62 0x63 0x64 0x31 0x32 0x33 0x34		Set login password to "abcd1234"
112	ESC GS) N 0x03 0x00 0x70 0x01 0x00		Save the above settings.

⟨Function 48⟩ESC GS) N pL pH fn m n (fn=48)

[Name]   Set acquisition method for IP address
[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   n
              HEX   1B   1D   29   4E   pL   pH   fn   m   n
              DEC   27   29   41   78   pL   pH   fn   m   n
[Defined Area]   pL = 3, pH = 0
                 fn = 48
                 m = 1 (Added description)
                 n = 0, 1
[Initial Value]   n = 0
[Function]   Sets the acquisition method for IP address.
[Details]   "n" specifies the acquisition method for IP address.

n	IP address acquisition method
0	DHCP
1	Static

When n = 0 is specified, the following settings are initialized.
ESC GS) N (fn=49)   Set IP address
ESC GS) N (fn=50)   Set subnet mask
ESC GS) N (fn=51)   Set default gateway

The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

⟨Function 49⟩ESC GS) N pL pH fn m d1 d2 d3 d4 (fn=49)

[Name]   Set IP Address
[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   d1   d2   d3   d4
              HEX   1B   1D   29   4E   pL   pH   fn   m   d1   d2   d3   d4
              DEC   27   29   41   78   pL   pH   fn   m   d1   d2   d3   d4
[Defined Area]   pL = 6, pH = 0
                 fn = 49
                 m = 1
                 $0 \leq d1 \leq 255, 0 \leq d2 \leq 255, 0 \leq d3 \leq 255, 0 \leq d4 \leq 255$
[Initial Value]   d1 = 0, d2 = 0, d3 = 0, d4 = 0
[Function]   Set IP Address.
               d1, d2, d3, and d4 specifies the IP address.
               Example: When setting the IP address to 192.168.1.10
               d1 = 192, d2 = 168, d3 = 1, d4 = 10

               This command becomes valid only when n=1 (Static) is set by ESC GS) N (fn=48).
               The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

⟨Function 50⟩ESC GS) N pL pH fn m d1 d2 d3 d4 (fn=50)

[Name]   Set Subnet Mask

[Code]

	ESC GS	)	N	pL	pH	fn	m	d1	d2	d3	d4
ASCII	ESC GS	)	N	pL	pH	fn	m	d1	d2	d3	d4
HEX	1B 1D	29	4E	pL	pH	fn	m	d1	d2	d3	d4
DEC	27 29	41	78	pL	pH	fn	m	d1	d2	d3	d4

[Defined Area]   pL = 6, pH = 0

                fn = 50

                m = 1

                $0 \leq d1 \leq 255$, $0 \leq d2 \leq 255$, $0 \leq d3 \leq 255$, $0 \leq d4 \leq 255$

[Initial Value]   d1 = 0, d2 = 0, d3 = 0, d4 = 0

[Function]   Sets the Subnet Mask

                d1, d2, d3, and d4 specifies the Subnet Mask.

                Example: When setting the Subnet Mask to 255.255.255.0

                d1 = 255, d2 = 255, d3 = 255, d4 = 0

                This command becomes valid only when n=1 (Static) is set by ESC GS) N (fn=48).

                The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

⟨Function 51⟩ESC GS) N pL pH fn m d1 d2 d3 d4 (fn=51)

[Name]   Set Default Gateway

[Code]

	ESC GS	)	N	pL	pH	fn	m	d1	d2	d3	d4
ASCII	ESC GS	)	N	pL	pH	fn	m	d1	d2	d3	d4
HEX	1B 1D	29	4E	pL	pH	fn	m	d1	d2	d3	d4
DEC	27 29	41	78	pL	pH	fn	m	d1	d2	d3	d4

[Defined Area]   pL = 6, pH = 0

                fn = 51

                m = 1

                $0 \leq d1 \leq 255$, $0 \leq d2 \leq 255$, $0 \leq d3 \leq 255$, $0 \leq d4 \leq 255$

[Initial Value]   d1 = 0, d2 = 0, d3 = 0, d4 = 0

[Function]   Sets the Default Gateway

                d1, d2, d3, and d4 specifies the Default Gateway.

                Example: When setting the Default Gateway to 192.168.1.254

                d1 = 192, d2 = 168, d3 = 1, d4 = 254

                This command becomes valid only when n=1 (Static) is set by ESC GS) N (fn=48).

                The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

<Function 52>ESC GS) N pL pH fn m n (fn=52)

[Name]   Set DHCP Timeout

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   n
                HEX   1B   1D   29   4E   pL   pH   fn   m   n
                DEC   27   29   41   78   pL   pH   fn   m   n

[Defined Area] pL = 3, pH = 0

                fn = 52

                m = 1

                n = 0,1

[Initial Value] n = 1

[Function]   Set DHCP Timeout

[Details]   n specifies the DHCP Timeout.

n	DHCP Timeout
0	Invalid
1	Valid

The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

<Function 54>ESC GS) N pL pH fn m n1 n2(fn=54)

[Name]   Set 9100 Data Timeout

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   n1   n2
                HEX   1B   1D   29   4E   pL   pH   fn   m   n1   n2
                DEC   27   29   41   78   pL   pH   fn   m   n1   n2

[Defined Area] pL = 4, pH = 0

                fn = 54

                m = 1

                n = 0,30,40,60,120,180,300 (n = n1 + n2x256)

[Initial Value] n = 0

[Function]   Set 9100 Data Timeout

[Details]   n(n = n1 + n2x256) specifies the 9100 Data Timeout(Sec.).

The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

⟨Function 58⟩ESC GS) N pL pH fn m d1 d2 d3 d4 (fn=58)

[Name]   Set DNS 1

[Code]

	ASCII	ESC	GS	)	N	pL	pH	fn	m	d1	d2	d3	d4
	HEX	1B	1D	29	4E	pL	pH	fn	m	d1	d2	d3	d4
	DEC	27	29	41	78	pL	pH	fn	m	d1	d2	d3	d4

[Defined Area]   pL = 6, pH = 0

              fn = 58

              m = 1

              $0 \leqq d1 \leqq 255$, $0 \leqq d2 \leqq 255$, $0 \leqq d3 \leqq 255$, $0 \leqq d4 \leqq 255$

[Initial Value]   d1 = 8, d2 = 8, d3 = 8, d4 = 8

[Function]   Set DNS 1

              d1, d2, d3, and d4 specifies the DNS 1.

              Example: When setting the DNS 1 to 1.2.3.4

              d1 = 1, d2 = 2, d3 = 3, d4 = 4

              This command is enabled only when logged in with ESC GS) N (fn=114) and the login password was changed with ESC GS) N (fn=128).

              The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

⟨Function 59⟩ESC GS) N pL pH fn m d1 d2 d3 d4 (fn=59)

[Name]   Set DNS 2

[Code]

	ASCII	ESC	GS	)	N	pL	pH	fn	m	d1	d2	d3	d4
	HEX	1B	1D	29	4E	pL	pH	fn	m	d1	d2	d3	d4
	DEC	27	29	41	78	pL	pH	fn	m	d1	d2	d3	d4

[Defined Area]   pL = 6, pH = 0

              fn = 59

              m = 1

              $0 \leqq d1 \leqq 255$, $0 \leqq d2 \leqq 255$, $0 \leqq d3 \leqq 255$, $0 \leqq d4 \leqq 255$

[Initial Value]   d1 = 8, d2 = 8, d3 = 4, d4 = 4

[Function]   Set DNS 2

              d1, d2, d3, and d4 specifies the DNS 2.

              Example: When setting the DNS 2 to 1.2.3.4

              d1 = 1, d2 = 2, d3 = 3, d4 = 4

              This command is enabled only when logged in with ESC GS) N (fn=114) and the login password was changed with ESC GS) N (fn=128).

              The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

＜Function 64＞ESC GS) N pL pH fn m (fn=64)

[Name]   Transmits the acquisition method for IP address.

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m

            HEX   1B   1D   29   4E   pL   pH   fn   m

            DEC   27   29   41   78   pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

                fn = 64

                m = 1

[Initial Value]   ---

[Function]   Transmits the acquisition method for IP address.

            The transmission is performed in the format below.

            ESC GS) N pL pH fn m n LF NUL

n	IP address acquisition method
0	DHCP
1	Static

＜Function 65＞ESC GS) N pL pH fn m (fn=65)

[Name]   Send IP Address

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m

            HEX   1B   1D   29   4E   pL   pH   fn   m

            DEC   27   29   41   78   pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

                fn = 65

                m = 1

[Initial Value]   ---

[Function]   Send IP Address

            The transmission is performed in the format below.

            ESC GS) N pL pH fn m d1 d2 d3 d4 LF NUL

            Example 1: When the IP address acquisition method is set to Static, and IP address is set to 192.168.1.10
            d1 = 192, d2 = 168, d3 = 1, d4 = 10

            Example 2: When the IP address acquisition method is set to DHCP, and IP address of 192.168.1.10 is
            already acquired from the DHCP server
            d1 = 192, d2 = 168, d3 = 1, d4 = 10

            Example 3: When the IP address acquisition method is set to DHCP, and IP address could not be
            acquired from the DHCP server
            d1 = 0, d2 = 0, d3 = 0, d4 = 0

\<Function 66\>ESC GS) N pL pH fn m (fn=66)

[Name]   Send Subnet Mask

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m
          HEX   1B 1D   29   4E pL   pH   fn   m
          DEC   27 29   41   78 pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

                 fn = 66

                 m = 1

[Initial Value]   ---

[Function]   Send Subnet Mask

              The transmission is performed in the format below.

              ESC GS) N pL pH fn m d1 d2 d3 d4 LF NUL

              Example 1: When the IP address acquisition method is set to Static, and Subnet Mask is set to
              255.255.255.0
              d1 = 255, d2 = 255, d3 = 255, d4 = 0

              Example 2: When the IP address acquisition method is set to DHCP, and Subnet Mask of 255.255.255.0 is
              already acquired from the DHCP server
              d1 = 255, d2 = 255, d3 = 255, d4 = 0

              Example 3: When the IP address acquisition method is set to DHCP, and Subnet Mask could not be
              acquired from the DHCP server
              d1 = 0, d2 = 0, d3 = 0, d4 = 0

\<Function 67\>ESC GS) N pL pH fn m (fn=67)

[Name]   Send Default Gateway

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m
          HEX   1B 1D   29   4E pL   pH   fn   m
          DEC   27 29   41   78 pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

                 fn = 67

                 m = 1

[Initial Value]   ---

[Function]   Send Default Gateway

              The transmission is performed in the format below.

              ESC GS) N pL pH fn m d1 d2 d3 d4 LF NUL

              Example 1: When the IP address acquisition method is set to Static, and Default Gateway is set to
              255.255.255.0
              d1 = 255, d2 = 255, d3 = 255, d4 = 0

              Example 2: When the IP address acquisition method is set to DHCP, and Default Gateway of
              255.255.255.0 is already acquired from the DHCP server
              d1 = 255, d2 = 255, d3 = 255, d4 = 0

              Example 3: When the IP address acquisition method is set to DHCP, and Default Gateway could not be
              acquired from the DHCP server
              d1 = 0, d2 = 0, d3 = 0, d4 = 0

<Function 68>ESC GS) N pL pH fn m (fn=68)

[Name]　　　Send DHCPTimeout

[Code]　　　ASCII　ESC GS　)　N　pL　pH　fn　m
　　　　　　HEX　　1B　1D　29　4E　pL　pH　fn　m
　　　　　　DEC　　27　29　41　78　pL　pH　fn　m

[Defined Area]　pL = 2, pH = 0
　　　　　　　fn = 68
　　　　　　　m = 1

[Initial Value]　---

[Function]　　Send DHCPTimeout
　　　　　　The transmission is performed in the format below.
　　　　　　ESC GS) N pL pH fn m n LF NUL

n	DHCP Timeout
0	Invalid
1	Valid

<Function 70>ESC GS) N pL pH fn m (fn=70)

[Name]　　　Send 9100 Data Timeout

[Code]　　　ASCII　ESC GS　)　N　pL　pH　fn　m
　　　　　　HEX　　1B　1D　29　4E　pL　pH　fn　m
　　　　　　DEC　　27　29　41　78　pL　pH　fn　m

[Defined Area]　pL = 2, pH = 0
　　　　　　　fn = 70
　　　　　　　m = 1

[Initial Value]　---

[Function]　　Send 9100 Data Timeout
　　　　　　The transmission is performed in the format below.
　　　　　　ESC GS) N pL pH fn m n1 n2 LF NUL

　　　　　　n1 + (n = n1 + n2x256) specifies the 9100 Data Timeout (Sec.).

　　　　　　Example 1: When the9100 data timeout method is set 300 Sec.
　　　　　　n1 = 44, n2 = 1

\<Function 74\>ESC GS) N pL pH fn m (fn=74)

[Name]   Send DNS 1

[Code]   ASCII   ESC GS)   N pL pH fn m

                HEX   1B 1D 29 4E pL pH fn m

                DEC   27 29 41 78 pL pH fn m

[Defined Area]   pL = 2, pH = 0

                fn = 74

                m = 1

[Initial Value]   ---

[Function]   Send DNS 1

                The transmission is performed in the format below.

                ESC GS) N pL pH fn m d1 d2 d3 d4 LF NUL

                Example: When setting the DNS 1 to 1.2.3.4

                d1 = 1, d2 = 2, d3 = 3, d4 = 4

                This command is enabled only when logged in with ESC GS) N (fn=114) and the login password was changed with ESC GS) N (fn=128).

                At other times, transmission is performed in the format below.

                ESC GS) N pL pH fn m LF NUL

\<Function 75\>ESC GS) N pL pH fn m (fn=75)

[Name]   Send DNS 2

[Code]   ASCII   ESC GS)   N pL pH fn m

                HEX   1B 1D 29 4E pL pH fn m

                DEC   27 29 41 78 pL pH fn m

[Defined Area]   pL = 2, pH = 0

                fn = 75

                m = 1

[Initial Value]   ---

[Function]   Send DNS 2

                The transmission is performed in the format below.

                ESC GS) N pL pH fn m d1 d2 d3 d4 LF NUL

                Example: When setting the DNS 2 to 1.2.3.4

                d1 = 1, d2 = 2, d3 = 3, d4 = 4

                This command is enabled only when logged in with ESC GS) N (fn=114) and the login password was changed with ESC GS) N (fn=128).

                At other times, transmission is performed in the format below.

                ESC GS) N pL pH fn m LF NUL

＜Function 80＞ESC GS) N pL pH fn m n (fn=80)

[Name]   Set TCP#9100

[Code]   ASCII   ESC GS   )   N pL pH fn m n

               HEX   1B 1D 29 4E pL pH fn m n

               DEC   27 29 41 78 pL pH fn m n

[Defined Area]   pL = 3, pH = 0

                 fn = 80

                 m = 1

                 n = 0,1

[Initial Value]   n = 1

[Function]   Set the TCP#9100

[Details]   n specifies TCP#9100 setting.

                 *SK5-31 are fixed to valid.

n	TCP#9100
0	Invalid
1	Valid

                 The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

＜Function 81＞ESC GS) N pL pH fn m (fn=81)

[Name]   Send TCP#9100

[Code]   ASCII   ESC GS   )   N pL pH fn m

               HEX   1B 1D 29 4E pL pH fn m

               DEC   27 29 41 78 pL pH fn m

[Defined Area]   pL = 2, pH = 0

                 fn = 81

                 m = 1

[Initial Value]   ---

[Function]   Send TCP#9100 setting.

                 The transmission is performed in the format below.

                 ESC GS) N pL pH fn m n LF NUL

n	TCP#9100
0	Invalid
1	Valid

⟨Function 82⟩ESC GS) N pL pH fn m n (fn=82)

[Name]   Set TCP#9101

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   n
              HEX   1B   1D   29   4E   pL   pH   fn   m   n
              DEC   27   29   41   78   pL   pH   fn   m   n

[Defined Area]   pL = 3, pH = 0

                 fn = 82

                 m = 1

                 n = 0,1

[Initial Value]   n = 1

[Function]   Set the TCP#9101

[Details]   n specifies TCP#9101 setting.

                  *SK5-31 are fixed to valid.

n	TCP#9101
0	Invalid
1	Valid

The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

⟨Function 83⟩ESC GS) N pL pH fn m (fn=83)

[Name]   Send TCP#9101

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m
              HEX   1B   1D   29   4E   pL   pH   fn   m
              DEC   27   29   41   78   pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

                 fn = 83

                 m = 1

[Initial Value]   ---

[Function]   Send TCP#9101 setting.

                  The transmission is performed in the format below.

                  ESC GS) N pL pH fn m n LF NUL

n	TCP#9101
0	Invalid
1	Valid

＜Function 84＞ESC GS) N pL pH fn m n (fn=84)

[Name]　　　　Set LPR

[Code]　　　　ASCII　ESC GS　)　N　pL　pH　fn　m　n

　　　　　　　HEX　　1B　1D　29　4E　pL　pH　fn　m　n

　　　　　　　DEC　　27　29　41　78　pL　pH　fn　m　n

[Defined Area]　pL = 3, pH = 0

　　　　　　　　fn = 84

　　　　　　　　m = 1

　　　　　　　　n = 0,1

[Initial Value]　n = 1

[Function]　　　Set the LPR

[Details]　　　　n specifies LPR setting.

　　　　　　　　*SK5-31 are fixed to valid.

n	LPR
0	Invalid
1	Valid

The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

＜Function 85＞ESC GS) N pL pH fn m (fn=85)

[Name]　　　　Send LPR

[Code]　　　　ASCII　ESC GS　)　N　pL　pH　fn　m

　　　　　　　HEX　　1B　1D　29　4E　pL　pH　fn　m

　　　　　　　DEC　　27　29　41　78　pL　pH　fn　m

[Defined Area]　pL = 2, pH = 0

　　　　　　　　fn = 85

　　　　　　　　m = 1

[Initial Value]　---

[Function]　　　Send LPR setting.

　　　　　　　　The transmission is performed in the format below.

　　　　　　　　ESC GS) N pL pH fn m n LF NUL

n	LPR
0	Invalid
1	Valid

\<Function 86\>ESC GS) N pL pH fn m n (fn=86)

[Name]   Set UDP#22222

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   n
        HEX   1B   1D   29   4E   pL   pH   fn   m   n
        DEC   27   29   41   78   pL   pH   fn   m   n

[Defined Area]   pL = 3, pH = 0

                fn = 86

                m = 1

                n = 0,1

[Initial Value]   n = 1

[Function]   Set the UDP#22222.

[Details]   n specifies UDP#22222 setting.

                *SK5-31 are fixed to valid.

n	UDP#22222
0	Invalid
1	Valid

The setting of this command is stored in the nonvolatile memory by ESC GS) N (fn=112), and will be reflected to the operation after a hardware reset is executed.

\<Function 87\>ESC GS) N pL pH fn m (fn=87)

[Name]   Send UDP#22222

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m
        HEX   1B   1D   29   4E   pL   pH   fn   m
        DEC   27   29   41   78   pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

                fn = 87

                m = 1

[Initial Value]   ---

[Function]   Send UDP#22222 setting.

                The transmission is performed in the format below.

                ESC GS) N pL pH fn m n LF NUL

n	UDP#22222
0	Invalid
1	Valid

＜Function 112＞ESC GS) N pL pH fn m n (fn=112)

[Name]　　　Save network parameter

[Code]　　　ASCII　ESC GS　)　N　pL　pH　fn　m　n

　　　　　　HEX　　1B　1D　29　4E　pL　pH　fn　m　n

　　　　　　DEC　　27　29　41　78　pL　pH　fn　m　n

[Defined Area]　pL = 3, pH = 0

　　　　　　fn = 112

　　　　　　m = 1

　　　　　　n = 0,1

[Initial Value]　---

[Function]　　In the cases above, the network parameter set by the command below is stored in the nonvolatile memory, and a hardware reset is executed.

ESC GS) N (fn=48)　Set acquisition method for IP address

ESC GS) N (fn=49)　Set IP Address

ESC GS) N (fn=50)　Set Subnet Mask

ESC GS) N (fn=51)　Set Default Gateway

ESC GS) N (fn=52)　Set DHCPTimeout

ESC GS) N (fn=54)　Set 9100 Data Timeout

ESC GS) N (fn=58)　Set DNS 1 *1

ESC GS) N (fn=59)　Set DNS 2 *1

ESC GS) N (fn=80)　Set TCP#9100

ESC GS) N (fn=82)　Set TCP#9101

ESC GS) N (fn=84)　Set LPR

ESC GS) N (fn=86)　Set UDP#22222

ESC GS) N (fn=128)　Set log in password *1

*1 : Saved only when logged in with ESC GS) N (fn=114) and the login password was changed with
　　ESC GS) N (fn=128).

After this command was sent, the next data must not be sent until the printer becomes online (becomes able to receive data).

"n" specifies whether or not the self print is performed after the hardware reset.

N	Self print after hardware reset
0	Without self print
1	With self print

<Function 113>ESC GS) N pL pH fn m n (fn=113)

[Name]　　　Initialize network parameter

[Code]　　　ASCII　ESC GS　)　N　pL　pH　fn　m　n

　　　　　　　HEX　　1B　1D　29　4E　pL　pH　fn　m　n

　　　　　　　DEC　　27　29　41　78　pL　pH　fn　m　n

[Defined Area]　pL = 3, pH = 0

　　　　　　　fn = 113

　　　　　　　m = 1

　　　　　　　n = 0,1

[Initial Value]　　－－－

[Function]　　Initializes the network parameter stored in the nonvolatile memory, and executes a hardware reset.

ESC GS) N (fn=48)　　Set acquisition method for IP address

ESC GS) N (fn=49)　　Set IP Address

ESC GS) N (fn=50)　　Set Subnet Mask

ESC GS) N (fn=51)　　Set Default Gateway

ESC GS) N (fn=52)　　Set DHCPTimeout

ESC GS) N (fn=54)　　Set 9100 Data Timeout

ESC GS) N (fn=58)　　Set DNS 1 *1

ESC GS) N (fn=59)　　Set DNS 2 *1

ESC GS) N (fn=80)　　Set TCP#9100

ESC GS) N (fn=82)　　Set TCP#9101

ESC GS) N (fn=84)　　Set LPR

ESC GS) N (fn=86)　　Set UDP#22222

ESC GS) N (fn=128)　Set log in password *1

*1 : Initialized only when logged in with ESC GS) N (fn=114) and the login password was changed with ESC GS) N (fn=128).

"n" specifies whether or not the self print is performed after the hardware reset.

n	Self print after hardware reset
0	Without self print
1	With self print

＜Function 114＞ESC GS) N pL pH fn m d1 … dk (fn=114)

[Name]   Execute Login

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   d1 … dk
              HEX   1B   1D   29   4E   pL   pH   fn   m   d1 … dk
              DEC   27   29   41   78   pL   pH   fn   m   d1 … dk

[Defined Area] $3 \leq pL + pH \times 256 = k + 2 \leq 33$

              fn = 114

              m = 1

              $k = (pL + pH \times 256)$

              $32 \leq d \leq 126$

[Initial Value]   ---

[Function]   Execute login.

              d1 … dk specifies the login password.

              Example: When specifying password "abcd1234"

              d1 = 97(0x61), d2 = 98(0x62), d3 = 99(0x63), d4 = 100(0x64), d5 = 49(0x31), d6 = 50(0x32),

              d7 = 51(0x33), d8 = 52(0x34)

              Depending on the function, the network parameter setting command may be enabled only when logged in.

              For details, refer to the network parameter setting command.

＜Function 115＞ESC GS) N pL pH fn m (fn=115)

[Name]   Send Login Status

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m
              HEX   1B   1D   29   4E   pL   pH   fn   m
              DEC   27   29   41   78   pL   pH   fn   m

[Defined Area]   pL = 2, pH = 0

              fn = 115

              m = 1

[Initial Value]   ---

[Function]   Send Login Status.

              The transmission is performed in the format below.

              ESC GS) N pL pH fn m n LF NUL

n	Login status
0	Not logged in
1	Logged in

<Function 116>ESC GS) N pL pH fn m n (fn=116)

[Name]   Execute Logout

[Code]   ASCII   ESC GS   )   N   pL   pH   fn   m   n

                HEX   1B   1D   29   4E   pL   pH   fn   m   n

                DEC   27   29   41   78   pL   pH   fn   m   n

[Defined Area] pL = 3, pH = 0

                fn = 116

                m = 1

                n = 0

[Initial Value]   ―――

[Function]   Execute Logout.

                This command is enabled only when logged in with ESC GS) N (fn=114).

                Depending on the function, the network parameter setting command may be enabled only when logged in.

                For details, refer to the network parameter setting command.

⟨Function 128⟩ESC GS) N pL pH fn m d1 … dk (fn=128)

[Name]   Set Login Password

[Code]   ASCII   ESC GS   )   N pL pH fn m d1 … dk

             HEX   1B 1D 29 4E pL pH fn m d1 … dk

             DEC   27 29 41 78 pL pH fn m d1 … dk

[Defined Area] $3 \leq pL + pH \times 256 = k + 2 \leq 33$

             $fn = 128$

             $m = 1$

             $pL + pH \times 256 = k + 2$

             $32 \leq d \leq 126$

[Initial Value]   "public"

             k = 6, d1 = 112(0x70), d2 = 117(0x75), d3 = 98(0x62), d4 = 108(0x6C), d5 = 105(0x69), d6 = 99(0x63)

[Function]   Set Login Password.

             d1 … dk specifies the login password.

             Example: When setting password to "abcd1234"

             d1 = 97(0x61), d2 = 98(0x62), d3 = 99(0x63), d4 = 100(0x64), d5 = 49(0x31), d6 = 50(0x32),

             d7 = 51(0x33), d8 = 52(0x34)

             This command is enabled only when logged in with ESC GS) N (fn=114).

             The setting of this command is applied to operation when this command is processed, and is saved in nonvolatile memory by ESC GS) N (fn=112).

             Depending on the function, the network parameter setting command may be enabled only when the login password was changed.

             For details, refer to the network parameter setting command.

⟨Function 129⟩ESC GS) N pL pH fn m (fn=129)

[Name]   Send Login Password Change Status

[Code]   ASCII   ESC GS   )   N pL pH fn m

             HEX   1B 1D 29 4E pL pH fn m

             DEC   27 29 41 78 pL pH fn m

[Defined Area]   pL = 2, pH = 0

             $fn = 129$

             $m = 1$

[Initial Value]   –––

[Function]   Send Login Password Change Status.

             The transmission is performed in the format below.

             ESC GS) N pL pH fn m n LF NUL

n	Login password change status
0	Login password not changed
1	Login password changed

             This command is enabled only when logged in with ESC GS) N (fn=114).

             At other times, transmission is performed in the format below.

             ESC GS) N pL pH fn m LF NUL

The following list describes the difference between SK1/5 StarPRNT mode and Native StarPRNT.

Command Category	Command/Function	Native StarPRNT	SK1/5 StarPRNT mode
Character Font	ANK character base line	ANK character (Font-A) Upper base line: 20 dots Lower base line: 4 dots	ANK character (Font-A) Upper base line: 21 dots Lower base line: 3 dots
	IBM Block	Font-A size: 12 x 32 Font-B size: 9 x 32	Font-A size: 12 x 24 Font-B size: 8 x 16
	Chinese Character commands	Supported	Not-supported
Font style and character set	ESC RS F n	Size of Spec Font-B: 9x24 dots	Size of Spec Font-B: 8x16 dots
	ESC GS t n	52 code pages	18 code pages (See Table.1 below)
	ESC GS t n (n=0)	Original code page	CodePage437
	ESC GS =	Supported	Not-supported
	ESC R n	16 international characters	9 international characters (See Table.2 below)
Page control Commands	ESC C 0 n	Supported	Not-supported
Bit image Graphics	ESC GS c h v	Supported	Not-supported
Logo	ESC GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1 ⋯ dk]1 ⋯ [c d1⋯ dk]b (fn=67)	Registration memory size / number: 512 KByte / 9025 pcs	Registration memory size / number: 512 KByte / 254 pcs
Barcode	ESC b n1 n2 n3 n4 d1 ⋯ dk RS	14 barcodes	9 barcodes (See Table.3 below)
QR Code commands	ESC GS y D 2 a m1 n1L n1H d11 d12 ⋯ d1k m2 n2L n2H d21 d22 ⋯ d2k ml ⋯ d1k	Supported	Not-supported
2D GS1 code, Compound symbol Commands	ESC GS (k pL pH on fn [parameter]	Supported	Not-supported
Initialization Command	ESC ACK CAN	Supported	Not-supported
Print settings	ESC RS r n	0≤n≤3, 48≤n≤51	0≤n≤7, 48≤n≤55 (See Table.4 below)
UTF Commands	ESC GS) U pL pH fn m (fn=64)	Supported	Not-supported
	ESC GS) U pL pH fn m (fn=48)	All supported	Partially not-supported (CodePage874, CodePage869)
2 color printing related commands	ESC RS c n	Supported	Not-supported
	ESC RS C n	Supported	Not-supported
Presenter related commands	ESC GS SUB DC1 m t1 t2	0≤m≤3, 48≤n≤51	0≤m≤4, 48≤m≤52
	ESC GS SUB DC2 m t1 t2	0≤m≤2, 48≤n≤50 LED unit ON/OFF times t1 x 50 msec t2 x 50 msec	0≤m≤3, 48≤n≤51 LED unit ON/OFF times t1 x 100 msec t2 x 100 msec
	ESC GS SUB DC3 m t1 t2	LED unit ON/OFF times t1 x 50 msec t2 x 50 msec	LED unit ON/OFF times t1 x 100 msec t2 x 100 msec

Command Category	Command/Function	Native StarPRNT	SK1/5 StarPRNT mode
Bezel related commands	ESC SYN DC1 n	Not-supported	Supported
	ESC SYN DC2 n	Not-supported	Supported
	ESC SYN DC3 n	Not-supported	Supported
	ESC SYN DC4 n	Not-supported	Supported
	ESC GS) s pl ph fn m	Not-supported	Supported
	ESC GS SUB DC1 m t1 t2	Not-supported	$0 \leq m \leq 4, 48 \leq m \leq 52$
	ESC GS SUB DC2 m t1 t2	Not-supported	$0 \leq m \leq 3, 48 \leq n \leq 51$ LED unit ON/OFF times t1 x 100 msec t2 x 100 msec
LAN	ESC GS) N pL pH fn m n(fn=53)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=55)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=56)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=57)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=69)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=71)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=72)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=73)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=88)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=89)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=130)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=131)	Supported	Not-supported
	ESC GS) N pL pH fn m d1 ... dk (fn=132)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=133)	Supported	Not-supported
	ESC GS) N pL pH fn m n1 n2 (fn=134)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=135)	Supported	Not-supported
	ESC GS) N pL pH fn m d1 ... dk (fn=136)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=137)	Supported	Not-supported
	ESC GS) N pL pH fn m d1 ... dk (fn=138)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=139)	Supported	Not-supported
	ESC GS) N pL pH fn m n d1 ... dk (fn=140)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=141)	Supported	Not-supported
	ESC GS) N pL pH fn m n d1 ... dk(fn=142)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=143)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=144)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=145)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=146)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=147)	Supported	Not-supported
	ESC GS) N pL pH fn m n(fn=148)	Supported	Not-supported
	ESC GS) N pL pH fn m(fn=149)	Supported	Not-supported
	ESC GS) N pL pH fn m d1 ... dk (fn=150)	Supported	Not-supported

Bezel related command is available with firmware version 1.1 or higher.

LAN command is available with SK5-31 model.

Table1. Code Page List

n	Code Page	Native StarPRNT	SK1 StarPRNT mode
0	Normal*	O	O
1	CodePage437 (USA,Std. Europe)	O	O
2	Katakana	O	O
3	CodePage437 (USA,Std. Europe)	O	O
4	Codepage 858 (Multilingual)	O	O
5	Codepage 852 (Latin-2)	O	O
6	Codepage 860 (Portuguese)	O	O
7	Codepage 861 (Icelandic)	O	X
8	Codepage 863 (Canadian French)	O	O
9	Codepage 865 (Nordic)	O	O
10	Codepage 866 (Cyrillic Russian)	O	O
11	Codepage 855 (Cyrillic Bulgarian)	O	X
12	Codepage 857 (Turkey)	O	O
13	Codepage 862 (Israel (Hebrew))	O	O
14	Codepage 864 (Arabic)	O	O
15	Codepage 737 (Greek)	O	O
16	Codepage 851 (Greek)	O	X
17	Codepage 869 (Greek)	O	X
18	Codepage 928 (Greek)	O	X
19	Codepage 772 (Lithuanian)	O	X
20	Codepage 774 (Lithuanian)	O	X
21	Codepage 874 (Thai)	O	X
32	Codepage 1252 (Windows Latin-1)	O	O
33	Codepage 1250 (Windows Latin-2)	O	O
34	Codepage 1251 (Windows Cyrillic)	O	O
64	Codepage 3840 (IBM-Russian)	O	X
65	Codepage 3841 (Gost)	O	X
66	Codepage 3843 (Polish)	O	X
67	Codepage 3844 (CS2)	O	X
68	Codepage 3845 (Hungarian)	O	X
69	Codepage 3846 (Turkish)	O	X
70	Codepage 3847 (Brazil-ABNT)	O	X
71	Codepage 3848 (Brazil-ABICOMP)	O	X
72	Codepage 1001 (Arabic)	O	X
73	Codepage 2001 (Lithuanian-KBL)	O	X
74	Codepage 3001 (Estonian-1)	O	X
75	Codepage 3002 (Estonian-2)	O	X
76	Codepage 3011 (Latvian-1)	O	X
77	Codepage 3012 (Latvian-2)	O	X
78	Codepage 3021 (Bulgarian)	O	X
79	Codepage 3041 (Maltese)	O	X
96	Thai Character Code 42 (Thai)	O	X
97	Thai Character Code 11 (Thai)	O	X
98	Thai Character Code 13 (Thai)	O	X
102	Thai Character Code 18 (Thai)	O	X
255	User Setting (Blank Code Page)	O	X

Table2. International Characters List

n	International Characters	Native StarPRNT	SK1 StarPRNT mode
0, 48	USA	O	O
1, 49	France	O	O
2, 50	Germany	O	O
3, 51	UK	O	O
4, 52	Denmark	O	O
5, 53	Sweden	O	O
6, 54	Italy	O	O
7, 55	Spain	O	O
8, 56	Japan	O	O
9, 57	Norway	O	X
10, 65	Denmark II	O	X
11, 66	Spain II	O	X
12, 67	Latin America	O	X
13, 68	Korea	O	X
14, 69	Ireland	O	X
64	Legal	O	X

Table3. Barcode List

n	Barcode type	Native StarPRNT	SK1 StarPRNT mode
0, 48	UPC-E	O	O
1, 49	UPC-A	O	O
2, 50	JAN/EAN8	O	O
3, 51	JAN/EAN13	O	O
4, 52	Code39	O	O
5, 53	ITF	O	O
6, 54	Code128	O	O
7, 55	Code93	O	O
8, 56	NW-7	O	O
9, 57	GS1-128	O	X
10, 65	GS1 DataBar Omnidirectional	O	X
11, 66	GS1 DataBar Truncated	O	X
12, 67	GS1 DataBar Limited	O	X
13, 68	GS1 DataBar Expanded	O	X

Table4. Printing Speed

〈SK1-211, SK1-221, SK1-311, SK1-321, SK5-31 series〉

n	Native StarPRNT	SK1 StarPRNT mode
0, 48	High	250mm/sec
1, 49	Middle	190mm/sec
2, 50	Low	110mm/sec
3, 51	X	220mm/sec
4, 52	X	200mm/sec
5, 53	X	170mm/sec
6, 54	X	150mm/sec
7, 55	X	130mm/sec

〈SK1-41 series〉

n	Native StarPRNT	SK1 StarPRNT mode
0, 48	High	150mm/sec
1, 49	Middle	130mm/sec
2, 50	Low	110mm/sec

APPENDIX-2. Bar Code Specification Details

A-2.1. Bar Code Specification Details

Refer to the dedicated manuals for characteristics and methods of use for each bar code symbol.

This section describes precautions and methods for setting when printing with the printer.

Bar code widths are set for each bar code according to the mode. The following describes each mode and the dot counts.

The user must ensure the specified printing position and quiet zone at the position where the bar code begins.

A-2.1.1. Code 39

Code 39 represents numbers 0 to 9 and the letters of the alphabet from A to Z.

These are the symbols most frequently used today in industry.

1. Length of characters in each mode

Items	Mode1	Mode2	Mode3	Mode4	Mode5	Mode6	Mode7	Mode8	Mode9
Narrow Width	2 dots	3 dots	4 dots	2 dots	3 dots	4 dots	2 dots	3 dots	4 dots
Wide Width	6 dots	9 dots	12 dots	5 dots	8 dots	10 dots	4 dots	6 dots	8 dots
Ratio	1 : 3	1 : 3	1 : 3	1 : 2.5	1 : 2.7	1 : 2.5	1 : 2	1 : 2	1 : 2
Character Spacing	2 dots	3 dots	4 dots	2 dots	3 dots	4 dots	2 dots	3 dots	4 dots
Length of 1 Character	4 mm	6 mm	8 mm	3.625mm	5.625mm	7.25mm	3.25mm	4.875mm	6.5mm

(∗) The length of 1 character includes the character spacing.

2. Regulations

The start and stop bar code (∗) in Code 39 are automatically inserted.

A-2.1.2. Interleaved 2 of 5

Interleaved 2 of 5 represents numbers 0 to 9. Higher density of characters is possible and with JIS and EAN, and printing to cardboard for distribution has been standardized.

1.Narrow element width and length of symbols per 2 characters

Items	Mode1	Mode2	Mode3	Mode4	Mode5	Mode6	Mode7	Mode8	Mode9
Narrow Width	2 dots	4 dots	6 dots	2 dots	4 dots	6 dots	2 dots	3 dots	4 dots
Wide Width	5 dots	10 dots	15 dots	4 dots	8 dots	12 dots	6 dots	9 dots	12 dots
Ratio	1 : 2.5	1 : 2.5	1 : 2.5	1 : 2	1 : 2	1 : 2	1 : 3	1 : 3	1 : 3
Length of 1 Character	4 mm	8 mm	12 mm	3.5mm	7mm	10.5mm	4.5mm	6.75mm	9mm

2. Regulations

・By selecting interleaved 2 of 5 bar code symbols, start and stop patterns are automatically inserted.

・When the bar code data digit count is odd, a zero is added to the highest value digit.

・Details conform to standards for AIM, USS-12/5, ANSI and JIS x 0502.

A-2.1.3. JAN/EAN/UPC

Used numbers, not only the bar code symbols, are controlled using JAN, EAN and UPC as shared common commercial codes.
Mainly, they are used for supermarkets such as shops and grocery stores.

1. Each mode and bar code width

Items		Mode 1	Mode 2	Mode3
Module Width		2 dots	3 dots	4 dots
Bar code width (＊)	JAN/EAN-8	16.75mm	25.125mm	33.5mm
	JAN/EAN-13	23.75mm	35.625mm	47.5mm
	UPC-A	23.75mm	35.625mm	47.5mm
	UPC-E	12.75mm	19.125mm	25.5mm

(＊) Includes the guard bar (left/right/center) but not the white space.

2. Regulations

・JAN/EAN-8:

　　　Data is in 7 or 8 digits. The command is ignored for others.

　　　The check digit uses a modulus weight of 10/3 and is automatically applied.

　　　When the calculated value and the numerical value of the 8thdigit differ, the calculated value has priority.

・JAN/EAN-13:

　　　Data is in 12 or 13 digits. The command is ignored for others.

　　　The check digit uses a modulus weight of 10/3 and is automatically applied.

　　　When the calculated value and the numerical value of the 13thdigit differ, the calculated value has priority.

・UPC-A:

　　　Data is in 11 or 12 digits. The command is ignored for others.

　　　The check digit uses a modulus weight of 10/3 and is automatically applied.

　　　When the calculated value and the numerical value of the 12thdigit differ, the calculated value has priority.

・UPC-E:

　　　Data is in 11 or 12 digits. The command is ignored for others.

　　　The check digit uses a modulus weight of 10/3 and is automatically applied.

　　　When the calculated value and the numerical value of the 12thdigit differ, the calculated value has priority.

　　　Data conversion to rectangles is automatic.

　　　Data that cannot be shortened is processed as invalid data.

A-2.1.4. Code 128

These are bar code symbols that can print ASCII 128 characters.　For that reason, use thereof is increasing.

1. Each module and module width

Items	Mode 1	Mode 2	Mode3
Module Width	2 dots	3 dots	4 dots
Length of 1 Character (✱)	2.75 mm	4.125 mm	5.5 mm

(✱) Start and stop bars not included.

2.　Regulations

When using <LF> with the command, control codes are not sent by the host PC, so the control codes are sent as data, as shown below.

・When sending the following data, it represents 2 characters set.

% (25H) represents %0 (25H 30H).

Control codes (00H to 1FH) represent 40H to 5FH applied behind %.

Control code (7FH) represents %5 (25H 35H).

Function codes represent 1 to 4 (31H to 34H) applied behind %.

Start codes represent 6 to 8 (36H to 38H) applied behind %.

・Stop code (SC)/Check character (CK) are automatically applied.

・When start code is omitted:

Uses START C when more than 4 digits continue after header.

Uses START A when initial data other than numbers are the control code.

Uses START B for other cases.

· 2 Character set code table

〈Control Codes〉

〈Control Codes〉	
Code	Format
NUL 00H	%@ 25H 40H
SOH 01H	%A 25H 41H
STX 02H	%B 25H 42H
ETX 03H	%C 25H 43H
EOT 04H	%D 25H 44H
ENQ 05H	%E 25H 45H
ACK 06H	%F 25H 46H
BEL 07H	%G 25H 47H
BS 08H	%H 25H 48H
HT 09H	%I 25H 49H
LF 0AH	%J 25H 4AH
VT 0BH	%K 25H 4BH
FF 0CH	%L 25H 4CH
CR 0DH	%M 25H 4DH
SO 0EH	%N 25H 4EH
SI 0FH	%O 25H 4FH
DLE 10H	%P 25H 50H
DC1 11H	%Q 25H 51H
DC2 12H	%R 25H 52H
DC3 13H	%S 25H 53H
DC4 14H	%T 25H 54H
NAK 15H	%U 25H 55H
SYN 16H	%V 25H 56H
ETB 17H	%W 25H 57H
CAN 18H	%X 25H 58H
EM 19H	%Y 25H 59H
SUB 1AH	%Z 25H 5AH
ESC 1BH	%[25H 5BH
FS 1CH	%¥ 25H 5CH
GS 1DH	%] 25H 5DH
RS 1EH	%^ 25H 5EH
US 1FH	%_ 25H 5FH

〈Control Codes〉	
Code	Format
% 25H	%0 25H 30H
DEL 7FH	%5 25H 35H

〈Function Codes〉		
Code	Format	
FNC1	%1 25H 31H	＊
FNC2	%2 25H 32H	＊
FNC3	%3 25H 33H	＊
FNC4	%4 25H 34H	＊

〈Start Codes〉		
Code	Format	
START A	%6 25H 36H	＊
START B	%7 25H 37H	＊
START C	%8 25H 38H	＊

A-2.1.5. Code 93

1. Each mode and module width

Items	Mode 1	Mode 2	Mode3
Module Width	2 dots	3 dots	4 dots
Length of 1 Character (∗)	2.25 mm	3.375 mm	4.5 mm

(∗) Start and stop bars not included.

2. Regulations

・Start/stop codes are automatically applied.

・Check character (C, K) is automatically applied.

・2 characters set expression conforms to Code 128.

However, items marked with '∗' are codes that can only be used with Code 128, and not with Code 93.

A-2.1.6. NW-7 (CODABAR)

NW-7 normally uses either A through D as the start/stop codes and represents special symbols (−(minus sign)/$ (dollar sign)/: (colon)// (slash)/. (period)/+ (plus sign) between 0 to 9.

These are used as carrier package marking bar codes, DPE (photo prints) and for medical related industries (USA).

1. Length of 1 character in each mode

Items		Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Narrow Element Width		2	3	4	2	3
Wide Element Width		6	9	12	5	8
Ratio		1:3	1:3	1:3	1:2.5	1:27
Character Spacing (dots)		2	3	4	2	3
Length of 1 Character	(Normally mm)	3	4.5	6	2.75	4.25
	(Width mm)	3.5	5.25	7	3.125	5.125

Items		Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width		4	2	3	4
Wide Element Width		10	4	6	8
Ratio		1:2.5	1:2	1:2	1:2
Character Spacing (dots)		4	2	3	4
Length of 1 Character	(Normally mm)	5.5	2.5	3.75	5
	(Width mm)	6.25	2.75	4.125	5.5

・With NW-7, lengths differ because narrow elements and wide elements are included according to the characters.

・Normal characters (narrow: 5, wide: 2) and numbers (0 to 9), −and $

・Wide characters (narrow: 4, wide: 3) , /, . , + , A to D

・Character spaces are included in 1 Character length.

APPENDIX-3. Automatic Status

A-3. 1. Automatic Status

Automatic status is a group of states that are automatically returned from the printer to the host when the printer's status has changed. Automatic status is composed of "Header-1," "Header-2" and "plurality of bytes of the printer status and is continuously returned to the host. The host always uses an identifying method to identify the data for every byte received. (It is possible that Xon/Xoff codes are exceptionally mixed in the automatic status in the Xon/Xoff mode (when using a serial I/F), so it is necessary to consider that on the receiving side). The valid/invalid conditions of the automatic status abide by the DIPSW settings for the initial values.

It is possible to change the conditions using the ESC RS a n command after turning ON the power.

Also, it is possible to get the automatic status using the ESC ACK SOH command, regardless of the valid/invalid conditions.

1. Header-1

Header-1is the 1-byte length information transmitted at the headof the automatic status.

The table below shows the composition of the Header-1. Header-1 represents the entire status transmission byte count, including Header-1, using bit 1 to bit 3 and bit 5. The host gets the transmission byte information and always receives the status data for that amount transmission bytes. For reference, the table below shows the relationship of actual transmissionbytes and the Header-1. Because the bit 0 that indicates that this is the Header-1 is normally 1 (the second byteand beyond is 0), to detect the Header-1, it is acceptable to verify that bit 0 is 1 and bit 4 = 0 for this data. Note that bit 6 is for future expansion and is ignored in host-side processes.

〈Header-1 (First Byte)〉

Bit	Status	Status		Applicable models *1	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"			–	–
6	Reserved (Fixed at "0")			–	–
5	Printer Status Byte Count (BIT3)			OK	OK
4	Fixed at "0"			–	–
3	Printer Status Byte Count (BIT2)			OK	OK
2	Printer Status Byte Count (BIT1)			OK	OK
1	Printer Status Byte Count (BIT0)			OK	OK
0	Fixed at "1"			–	–

*1. Applicable models

    Without Presenter - SK1 printers which do not equip a presenter option. (PR-SK1-x1 or PR2-SK1-x1)

    With Presenter -　SK1 printers which equip a presenter option. (PR-SK1-x1 or PR2-SK1-x1)

Actual transmission byte count and header-1 table

Transmission Byte Count n	Header-1	Model
9	00100011B (23 Hex)	Without Presenter model With Presenter model

2. Header-2

Header-2 is the 1-byte length information transmitted from the second byte of the automatic status.

The table below shows the composition of the Header-2.

Header-2 represents the automatic status version (called automatic status version below) using bit 1 to bit3 and bit 5.

For reference, the table below shows the relationship of actual version bytes and the Header-2. The automatic status version will be used as new information is added to the printer status bit positions that were empty, by adding new functions in the future.

When the host does not control the automatic status version, it is acceptable to ignore Header-2 received.

〈Header-2 (Second Byte)〉

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"			–	–
6	Fixed at "0"			–	–
5	Version No. (BIT3)			OK	OK
4	Fixed at "0"			–	–
3	Version No. (BIT2)			OK	OK
2	Version No. (BIT1)			OK	OK
1	Version No. (BIT0)			OK	OK
0	Fixed at "0"			–	–

Actual automatic status version and header -2 table

Version No. n	Header-2
1	0000 0010B (02 Hex)
2	0000 0100B (04 Hex)
3	0000 0110B (06 Hex)
4	0000 1000B (08 Hex)
5	0000 1010B (0A Hex)
6	0000 1100B (0C Hex)
7	0000 1110B (0E Hex)
8	0010 0000B (20 Hex)
9	0010 0010B (22 Hex)

Printer Status Version

Model Name	Version No	Status
Without Presenter model With Presenter model	3 (06 Hex)	Up to printer status (9th byte) loaded

3. Printer Status

Printer status is the status of the printer sent from the third byte of the automatic status.

Printer status is returned for (transmitted byte count −2 in Header−1).

Printer status is always updated for new information (No log exists). The following shows the composition of the status.

〈Printer status 1: Printer status (Third Byte)〉

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	Fixed at "0"	–	–	–	–
5	Head up lever	CLOSE	OPEN	OK	OK
4	Fixed at "0"	–	–	–	–
3	ON-LINE / OFF-LINE Status	ON-LINE	OFF-LINE	OK	OK
2	Fixed at "0"	–	–	–	–
1	〈ETB 〉 Command	Not Executed	Executed	OK	OK
0	Fixed at "0"	–	–	–	–

· 〈ETB〉 Command

Cleared when received at the host (by clearing bit 1 to 0, automatic status is not targeted to occur).

〈Printer status 2: Error Information (Fourth Byte)〉

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	Stopped by high head temperature	Not stopped	Stopped	OK	OK
5	Non-recoverable Error	No	Yes	OK	OK
4	Fixed at "0"	–	–	–	–
3	Auto-cutter Error	No	Yes	OK	OK
2	Head Thermistor Error	No	Yes	OK	OK
1	Fixed at "0"	–	–	–	–
0	Fixed at "0"	–	–	–	–

\<Printer status 3: Error Information (Fifth Byte)\>

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	Receive Buffer Overflow	No	Yes	OK	OK
5	Reserved (Fixed at "0")	–	–	–	–
4	Fixed at "0"	–	–	–	–
3	BM Error/Label Error	No	Yes	OK	OK
2	Presenter/Bezel Paper Jam Error	No	Yes	OK	OK
1	Electric Voltage Error	No	Yes	OK	OK
0	Fixed at "0"	–	–	–	–

Label Error and Bezel Paper Jam Error status is available with firmware version 1.1 or higher.

·Receive Buffer Overflow

Overflow errors cleared to 0 when returned to host.

· BM Error

On models that use a common PE and BM sensor, if a continuous error is detected beyond a determined amount, it indicates not a black mark error, but a paper out error.

\<Printer status 4: Sensor Information (Sixth Byte)\>

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	Fixed at "0"	–	–	–	–
5	Fixed at "0"	–	–	–	–
4	Fixed at "0"	–	–	–	–
3	Paper end	Paper	No paper	OK	OK
2	Paper Near-end	Paper	No paper	OK	OK
1	Fixed at "0"	–	–	–	–
0	Fixed at "0"	–	–	–	–

\<Printer status 5: Sensor Information (Seventh Byte)\>

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	Fixed at "0"	–	–	–	–
5	Fixed at "0"	–	–	–	–
4	Fixed at "0"	–	–	–	–
3	Reserved (Fixed at "0")	–	–	–	–
2	Reserved (Fixed at "0")	–	–	–	–
1	Bezel paper sensor	No paper	Paper	OK	–
0	Fixed at "0"	–	–	–	–

Bezel paper sensor status is available with firmware version 1.1 or higher.

\<Printer status 6: ETB Counter (Eighth Byte)\>

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	ETB Counter BIT-4				
5	ETB Counter BIT-3				
4	Fixed at "0"	–	–	–	–
3	ETB Counter BIT-2				
2	ETB Counter BIT-1				
1	ETB Counter BIT-0				
0	Fixed at "0"	–	–	–	–

(∗) ETB Counter

This counter is the 5-bit ETB counter.

(It counts from 0 to 31. When the counter overflows, it counts up from 31 to 0.)

This counter is incremented by 1 using the \<ETB\> command.

The ETB counter is initialized by the following commands.　When doing so, ASB ETB status is cleared.

However, when initializing the ETB counter, ASB is not transmitted.

\<ETB Counter Initialization Commands\>

・\<ESC\> \<RS\> E n: ETB Counter Initialization

\<Printer status 7: Position for Presenter Paper (Ninth Byte)\>

Bit	Status	Status		Applicable models	
		0	1	Without Presenter model	With Presenter model
7	Fixed at "0"	–	–	–	–
6	Fixed at "0"	–	–	–	–
5	Fixed at "0"	–	–	–	–
4	Fixed at "0"	–	–	–	–
3	Presenter Paper Position	See table below		–	OK
2	Presenter Paper Position			–	OK
1	Presenter Paper Position			–	OK
0	Fixed at "0"	–	–	–	–

·This status is valid only on models provided with a presenter.

　Models not provided with a presenter should send this status fixed at "0."

·This status is made valid and invalid using the memory switch only on models provided with a presenter.

When valid, the presenter paper position status is updated, but when invalid, the presenter paper position status is fixed

at "0" and there is no change in status.

Details of the Presenter Paper Position

Bit3-1	Presenter Paper Position
0	Paper Position 0 State where there is no paper in presenter
1	Paper Position 1 State where paper is supplied (Loop, start of clamp)
2	Paper Position 2 (Reserved)
3	Paper Position 3 State where paper is discharged (after cut)
4	Paper Position 4 (Reserved)
5	Paper Position 5 (Reserved)
6	Paper Position 6 State where paper is recovered
7	Paper Position 7 State where paper is pulled out.

5. Status Identification Method

Command/Function	Status							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
XON	0	0	0	1	0	0	0	1
XOFF	0	0	0	1	0	0	1	1
ASB (header 1)	0	＊	＊	0	＊	＊	＊	1
ASB (Other than header 1)	0	＊	＊	0	＊	＊	＊	0

0 = Indicates a bit fixed to "0". / 1 = Indicates a bit fixed to "1". / ＊ = Indicates a variable bit.

A-3. 2. Printer Status Transmission Specification for Ethernet I/F

Describes the printer status transmission specification for the Ethernet I/F

1) Transmission format

・If you want to send only STAR ASB

   | STAR ASB (2nd byte Bit-7=1) | + | Length | （Length = 0x0000 ）

・If you want to send printer status transmission other than STAR ASB

   | STAR ASB (2nd byte Bit-7=1) | + | Length | + | Status Data |

   〈Length details〉

   ・2-byte value indicating the number of bytes of status data (0x0000 ≦ Length ≦ 0x0200)

   ・If Status data is 10 bytes, Length = 0x000a

   ・If sending only STAR ASB, add Length = 0x0000

   ・If length is added to STAR ASB second byte Bit-7, then is set to Bit-7 = 1

Detect whether analysis of status detects all the bytes for ASB for the first byte STAR ASB, and length is added to the bit-7 for the 2nd byte for STAR ASB.

Furthermore by obtaining the number of bytes of subsequent Status Data with the length, analyzed status is possible.

2) | Status Data | Transmission format

   | Status Type | + | delimiter 1 | + | Data Type | + | Status Length | + | Printer Status | + | delimiter 2 |

   1. Status Type (2byte or 4Byte)

   ・〈 Header 1 (the second byte) 〉

      It indicates the cause of printer status

   2. Delimiter 1 (1 byte)

      Transmit ":"

   3. Data Type (1 byte)

      Indicate the data type of the Printer Status, and send "B" (the binary type)

   4. Status Length (2byte)

      2-byte value that indicates the number of bytes in the Printer Status

   5. Printer Status (variable length)

      Status transmitted by the printer

      Status contents are different due to the occurrence factor

      For more information on status content, refer to cause of command, and automatic status

   6. Delimiter 2 (1 byte)

      Transmit ";"

3) Status transmission specification list

| Status causes | STAR ASB | Length | Status Data | | | | | |
			Status Type / The first and second byte occurrence factor	Delimiter 1	Data Type	Status Length	Printer Status	Delimiter 2
ASB Automatic status (∗1)	ASB	0x0000	––	––	––	––	––	––
ESC ACK SOH Request printer status	ASB	0x0000	––	––	––	––	––	––
ESC # ∗ Request printer version	ASB	Variable length	"11"	":"	"B"	Variable length	Status	";"
ESC GS ETX s n1 n2 Request print end counter	ASB	0x000F	"20"	":"	"B"	0x0008	Status	";"
Request other command response	ASB	Variable length	"A1"	":"	"B"	Variable length	Block Data	";"

∗1) For automatic status it is delivered to all hosts in the TCP # 9100 port connection.

Note) Depending on a model, the installed memory switch region differs.

APPENDIX-4. Maximum Number of Input Characters for Each Version of QR Code

1) Model 1 Version and Maximum Number of Input Characters

Version	Cell Count on One Side	Mistake Correction Level	Number of Characters	English Characters	Binary	Kanji
1	21	L	40	24	17	10
		M	33	20	14	8
		Q	25	15	11	6
		H	16	10	7	4
2	25	L	81	49	34	20
		M	66	40	28	17
		Q	52	31	22	13
		H	33	20	14	8
3	29	L	131	79	55	33
		M	100	60	42	25
		Q	81	49	34	20
		H	52	31	22	13
4	33	L	186	113	78	48
		M	138	84	58	35
		Q	114	69	48	29
		H	76	46	32	19
5	37	L	253	154	106	65
		M	191	116	80	49
		Q	157	95	66	40
		H	105	63	44	27
6	41	L	321	194	134	82
		M	249	151	104	64
		Q	201	122	84	51
		H	133	81	56	34
7	45	L	402	244	168	103
		M	311	188	130	80
		Q	253	154	106	65
		H	167	101	70	43
8	49	L	493	299	206	126
		M	378	229	158	97
		Q	301	183	126	77
		H	203	123	85	52
9	53	L	585	354	244	150
		M	441	267	184	113
		Q	369	223	154	94
		H	239	145	100	61
10	57	L	690	418	287	177
		M	526	319	219	135
		Q	433	262	180	111
		H	291	176	121	74
11	61	L	800	485	333	205
		M	608	368	253	156
		Q	493	299	205	126
		H	342	207	142	87
12	65	L	915	555	381	234
		M	694	421	289	178
		Q	579	351	241	148
		H	390	236	162	100
13	69	L	1030	624	429	264
		M	790	479	329	202
		Q	656	398	273	168
		H	454	275	189	116
14	73	L	1167	707	486	299
		M	877	531	365	225
		Q	738	447	307	189
		H	498	302	207	127

2) Model 2 Version and Maximum Number of Input Characters

Version	Cell Count on One Side	Mistake Correction Level	Number of Characters	English Characters	Binary	Kanji
1	21	L	41	25	17	10
		M	34	20	14	8
		Q	27	16	11	7
		H	17	10	7	4
2	25	L	77	47	32	20
		M	63	38	26	16
		Q	48	29	20	12
		H	34	20	14	8
3	29	L	127	77	53	32
		M	101	61	42	26
		Q	77	47	32	20
		H	58	35	24	15
4	33	L	187	114	78	48
		M	149	90	62	38
		Q	111	67	46	28
		H	82	50	34	21
5	37	L	255	154	106	65
		M	202	122	84	52
		Q	144	87	60	37
		H	106	64	44	27
6	41	L	322	195	134	82
		M	255	154	106	65
		Q	178	108	74	45
		H	139	84	58	36
7	45	L	370	224	154	95
		M	293	178	122	75
		Q	207	125	86	53
		H	154	93	64	39
8	49	L	461	279	192	118
		M	365	221	152	93
		Q	259	157	108	66
		H	202	122	84	52
9	53	L	552	335	230	141
		M	432	262	180	111
		Q	312	189	130	80
		H	235	143	98	60
10	57	L	652	395	271	167
		M	513	311	213	131
		Q	364	221	151	93
		H	288	174	119	74
11	61	L	772	468	321	198
		M	604	366	251	155
		Q	427	259	177	109
		H	331	200	137	85
12	65	L	883	535	367	226
		M	691	419	287	177
		Q	489	296	203	125
		H	374	227	155	96
13	69	L	1022	619	425	262
		M	796	483	331	204
		Q	580	352	241	149
		H	427	259	177	109
14	73	L	1101	667	458	282
		M	871	528	362	223
		Q	621	376	258	159
		H	468	283	194	120

| Version	Cell Count on One Side	Mistake CorrectionLevel	Number of Characters	English Characters	Binary	Kanji
15	77	L	1250	758	520	320
		M	991	600	412	254
		Q	703	426	292	180
		H	530	321	220	136
16	81	L	1408	854	586	361
		M	1082	656	450	277
		Q	775	470	322	198
		H	602	365	250	154
17	85	L	1548	938	644	397
		M	1212	734	504	310
		Q	876	531	364	224
		H	674	408	280	173
18	89	L	1725	1046	718	442
		M	1346	816	560	345
		Q	948	574	394	243
		H	746	452	310	191
19	93	L	1903	1153	792	488
		M	1500	909	624	384
		Q	1063	644	442	272
		H	813	493	338	208
20	97	L	2061	1249	858	528
		M	1600	970	666	410
		Q	1159	702	482	297
		H	919	557	382	235
21	101	L	2232	1352	929	572
		M	1708	1035	711	438
		Q	1224	742	509	314
		H	969	587	403	248
22	105	L	2409	1460	1003	618
		M	1872	1134	779	480
		Q	1358	823	565	348
		H	1056	640	439	270
23	109	L	2620	1588	1091	672
		M	2059	1248	857	528
		Q	1468	890	611	376
		H	1108	672	461	284
24	113	L	2812	1704	1171	721
		M	2188	1326	911	561
		Q	1588	963	661	407
		H	1228	744	511	315
25	117	L	3057	1853	1273	784
		M	2395	1451	997	614
		Q	1718	1041	715	440
		H	1286	779	535	330
26	121	L	3283	1990	1367	842
		M	2544	1542	1059	652
		Q	1804	1094	751	462
		H	1425	864	593	365
27	125	L	3514	2132	1465	902
		M	2701	1637	1125	692
		Q	1933	1172	805	496
		H	1501	910	625	385
28	129	L	3669	2223	1528	940
		M	2857	1732	1190	732
		Q	2085	1263	868	534
		H	1581	958	658	405

Version	Cell Count on One Side	Mistake CorrectionLevel	Number of Characters	English Characters	Binary	Kanji
29	133	L	3909	2369	1628	1002
		M	3035	1839	1264	778
		Q	2181	1322	908	559
		H	1677	1016	698	430
30	137	L	4158	2520	1732	1066
		M	3289	1994	1370	843
		Q	2358	1429	982	604
		H	1782	1080	742	457
31	141	L	4417	2677	1840	1132
		M	3486	2113	1452	894
		Q	2473	1499	1030	634
		H	1897	1150	790	486
32	145	L	4686	2840	1952	1201
		M	3693	2238	1538	947
		Q	2670	1618	1112	684
		H	2022	1226	842	518
33	149	L	4965	3009	2068	1273
		M	3909	2369	1628	1002
		Q	2805	1700	1168	719
		H	2157	1307	898	553
34	153	L	5253	3183	2188	1347
		M	4134	2506	1722	1060
		Q	2949	1787	1228	756
		H	2301	1394	958	590
35	157	L	5529	3351	2303	1417
		M	4343	2632	1809	1113
		Q	3081	1867	1283	790
		H	2361	1431	983	605
36	161	L	5836	3537	2431	1496
		M	4588	2780	1911	1176
		Q	3244	1966	1351	832
		H	2524	1530	1051	647
37	165	L	6153	3729	2563	1577
		M	4775	2894	1989	1224
		Q	3417	2071	1423	876
		H	2625	1591	1093	673
38	169	L	6479	3927	2699	1661
		M	5039	3054	2099	1292
		Q	3599	2181	1499	923
		H	2735	1658	1139	701
39	173	L	6743	4087	2809	1729
		M	5313	3220	2213	1362
		Q	3791	2298	1579	972
		H	2927	1774	1219	750
40	177	L	7089	4296	2953	1817
		M	5596	3391	2331	1435
		Q	3993	2420	1663	1024
		H	3057	1852	1273	784

A-5.6.1. Overview

This printer is equipped with two print modes. They are standard and page mode.

In standard mode, the printer prints and feeds paper each time it receives the print and paper feed instructions, but the print and paper feed instructions received in page mode are executed on the print region on the specified memory and the printer does not operate. Then, when the ESC GS P6 or ESC GS P7 commands are executed, the printer batch expands data to the printing region and prints. In other words, when printing and performing a line feed for data of "ABCDEF" <LF>, in standard mode, "ABCDEF" is printed and paper is fed one line. In page mode, however, "ABCDEF" is written to the print region specified on the memory, and one line is moved on the memory to write the next print data. This printer will enter page mode using ESC GS P 0. Commands received thereafter are all processed as page mode. By running ESC GS P 6, you can lump-print received data. Also, by running ESC GS P 7, you can return to standard mode after lump printing received data. You can return to standard mode without printing page mode print data using ESC GS P 1. However, print data will be cleared.

<Transitioning to Standard Mode and Page Mode>
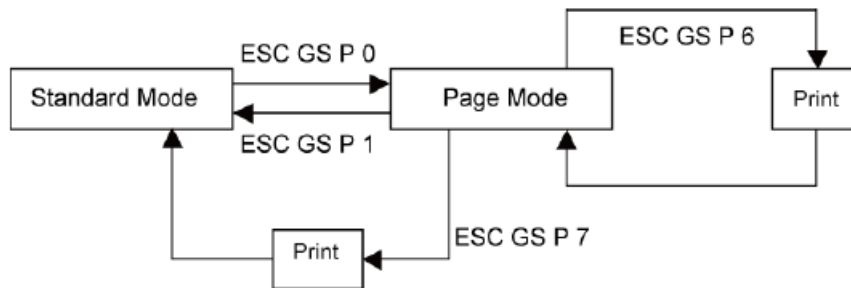
A-5.6.2. Setting Values Using Each Command in Standard Mode and Page Mode

· The values set by each command are shared by both standard and page modes. However, only the settings of the following commands are independently set.

-> ESC 0, ESC SP, ESC z, ESC D, ESC s, ESC t

· The following commands are invalid in page mode.

->ESC GS c, ESC RS m, ESC RS A, ESC GS M, ESC GS r, ESC RS C, ESC *, ESC RS r, FF, ESC GS S

· The maximum number of dots is prescribed in standard mode, but the y directions (the x direction when there is no rotation) when printing is rotated 90 or 270° are larger than that. For details, see the setting (ESC GS P 3) command of the print region in page mode.

A-5.6.3. Print Data Expansion to the Print Region

Expanding print data to the print region is performed in the following way.

(1) The print region is set by ESC GS P 3, but when all printing and paper feeds are ended before the printer receives ESC GS P 3 the left edge when facing the printer becomes the origin of the print region (x0, y0). The print region is a square shape using dx pitch for the x direction (horizontal direction) and by pitch for the y direction (perpendicular direction) as sides, including the origin point from the origin points (x0, y0). (When ESC GS P 3 is not set, the initial value is the print region.)

(2) When the print region is set by ESC GS P 3, and the printer receives print data after the print direction is set by ESC GS P 2, point A (Fig A) becomes the starting point initial value, and the print data is expanded in the print region. For characters, this starting point is the base line. Downloaded bit images and bar codes are expanded using the lower left-hand point of the image data as the baseline (Fig B). However, HRI characters with a bottom bar code are printed below the base line. When expanding characters (double-tall characters) higher than the standard character height and download bit images and the like at the starting point, the portion higher than the standard characters is not printed.

(3) If the print data is out of the print region (including character right spaces) before receiving commands that accompany line feeds (LF, ESC J and the like), the line feed is automatically performed in the print region, and the expansion position of the print data is moved one line so the next expansion position is at the top of the line. The line feed amount at that time uses the line feed amount set by ESC 0.
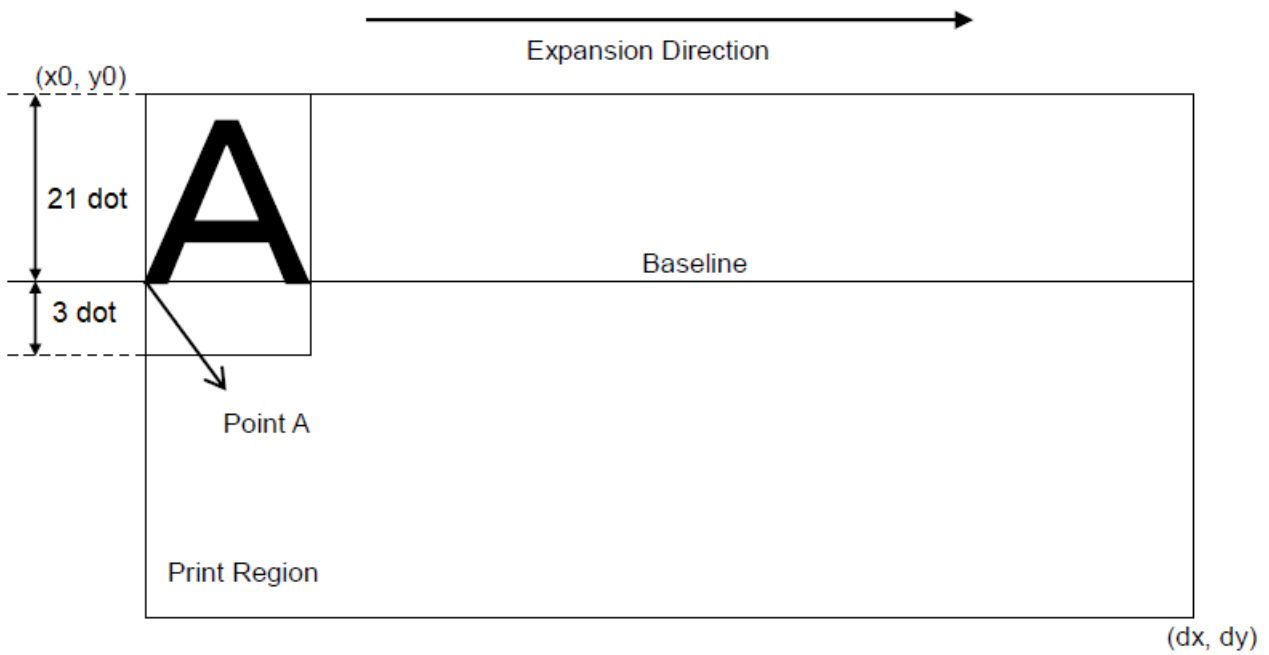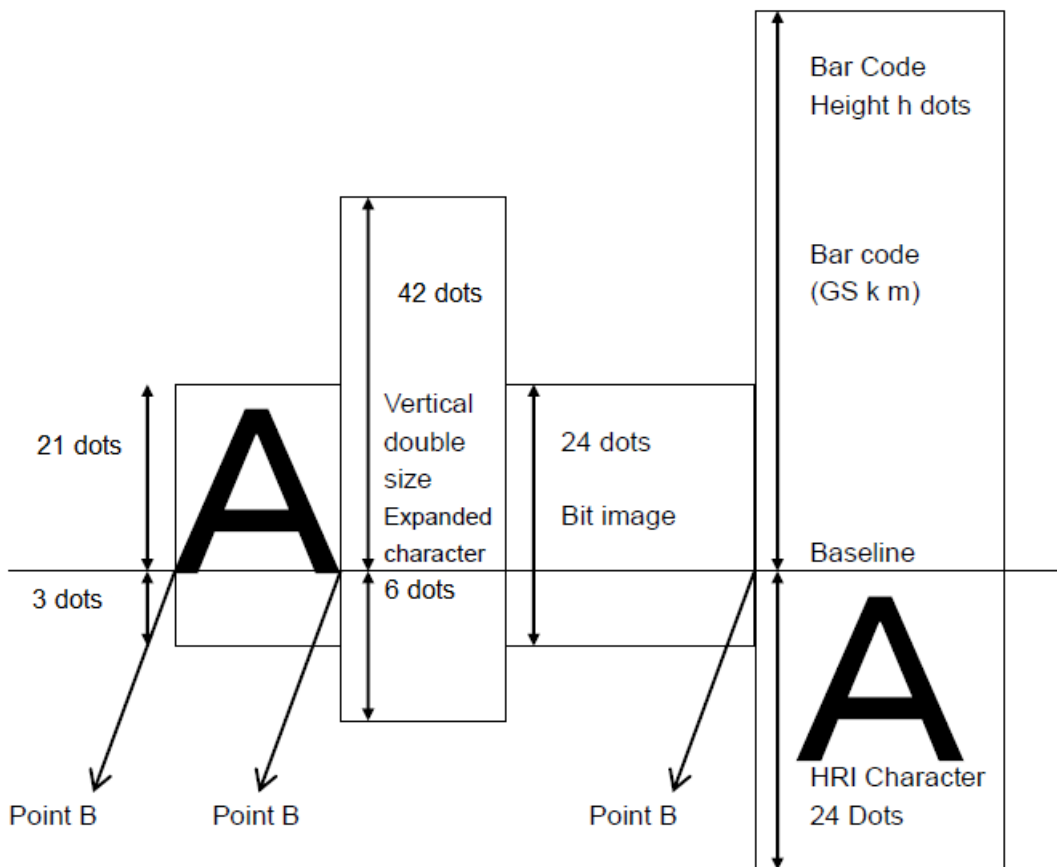
Fig A. Expansion Position of Character Data

Expansion Direction

(x0, y0)

21 dot

3 dot

Point A

Baseline

Print Region

(dx, dy)

Fig B. Expansion Position of Print Data

Bar Code
Height h dots

42 dots

Bar code
(GS k m)

21 dots

Vertical
double
size
Expanded
character

24 dots

Bit image

Baseline

3 dots

6 dots

Point B

Point B

Point B

HRI Character
24 Dots

A-5.6.4. Page Mode Print Maximum Region

Page mode print region initial value, Maximum Value. (ESC GS P 3 xL xH yL yH dxL dxH dyL dyH)

Model	Print region	Initial Value						Maximum Value	
		dxL	dxH	dyL	dyH	Print region		Print region	
						X Dir	Y Dir	X Dir	Y Dir
SK1-211	54mm	176	1	170	3	54mm	117.3mm	54mm	300mm
	56mm	192	1	170	3	56mm	117.3mm	56mm	300mm
SK1-311 / SK5-31	54mm	176	1	170	3	54mm	117.3mm	54mm	300mm
	56mm	192	1	170	3	56mm	117.3mm	56mm	300mm
	68mm	32	2	170	3	68mm	117.3mm	68mm	300mm
	72mm	64	2	170	3	72mm	117.3mm	72mm	300mm
	80mm	128	2	170	3	80mm	117.3mm	80mm	300mm
SK1-41	72mm	64	2	170	3	72mm	117.3mm	72mm	350mm
	80mm	128	2	170	3	80mm	117.3mm	80mm	350mm
	104mm	64	3	170	3	104mm	117.3mm	104mm	350mm

Basic calculated pitch initial value: X=1/203(inch), Y=1/203(inch)

When print startup control is set to page units, printing starts when the image buffer length is full or the following commands are run.

If data with vertical movement such as line feed is received, printing starts after a 1-second timeout.

For details on image buffer length and how to set print startup control, see the product specifications manual.

Print starting trigger

・Cutter command　　　　　: <ESC> d n

・FF command　　　　　　: <FF>

・BM detection command　: <ESC> d n, <FF>